

The Mining And Metallurgical Journal

VOL. XXI. NO. 10

LOS ANGELES, CAL.,

July 1, 1899,

NEW YORK, N. Y.

Price 15 Cents

ASSAYER and CHEMIST

Mark samples plainly, advise by letter of full details, with charges enclosed. Postage on ore one cent per ounce.

C. H. VOLLM

34 Roxwell Bldg. SEATTLE, WASHINGTON

Oiled and Paraffined Canvas Covering for Machinery, etc.

Tents and Canvas Sheeting

JOHN HARRISON,

167 South Street, - - - New York

PATENTS!

TOWNSEND BROTHERS
SOLICITORS
OF PATENTS

Patents on Inventions secured in all countries. Copyrights, Trade Marks and Labels. OFFICE, 321 Potomac Block

Telephone 347. Los Angeles, Cal.

Joseph Dixon Crucible Co.

MINERS, IMPORTERS AND MANUFACTURERS

GRAPHITE & PLUMBAGO

RETORTS, CRUCIBLES, GRAPHITE LUBRICANTS, BELT DRESSING, GRAPHITE PAINTS, LEAD PENCILS, AND GRAPHITE PRODUCTS OF ALL KINDS.

Send for Production Catalogue.

JERSEY CITY, N. J.

Graphite Makes the Best Lubricant and Best Paint.

ADAMANTINE SHOES & DIES

AND

CHROME CAST STEEL

Cams, Tappets, Bosses, Roll Shells and Crusher Plates.

These castings are extensively used in all the Mining States and Territories of North and South America. Guaranteed to prove better and cheaper than any others. Orders solicited subject to above conditions. When ordering send sketch with exact dimensions. Send for Illustrated Circular.

CHROME STEEL WORKS,

Kent Ave. & Keap St., - BROOKLYN, N. Y.

Stamp Dies

The Pelton Water Wheel

Affords the Most Economical and Reliable Power for Mining, Electric and all other purposes.

9000 WHEELS NOW RUNNING

PELTON WATER WHEEL CO., 121 Main St., San Francisco, Cal.

Mexican, American and Foreign Patents, TRADEMARKS, ETC.

Reports on Mining and Other Properties. Proprietors of Weekly Anglo-American, a first-class Advertising Medium. Established 9 Years.

C. H. M. y Agramonte,
P. O. Box 388. Cable Address, "Agra"

CITY OF MEXICO, MEXICO

The Edward P. Allis Company

MILWAUKEE, WISCONSIN

SEE PAGE 23.

A. H. HANDLAN,
President and Manager

E. W. HANDLAN,
Secretary and Treasurer

M. M. BUCK MFG. CO.

Railway and Contractors Supplies

Machine Tools, Heavy Hardware and Metals; Mine, Mill, Smelter and Foundry Supplies; Manufacturers of Locomotive Head Lights; Train and Station Signal Lights, Lanterns, Oil Filters, Lubricators, Injectors, &c.

921 North 3d Street,

St. Louis, Mo.



We are acting as Purchasing Agents for more than thirty mining companies. We desire to make contracts with others to act for them as their Purchasing Agents in this market. Give us an opportunity to send you information and references. We can save you money. Do you wish to receive our Market Letters, giving prices of machinery and supplies, condition of the market, probable change, etc?

Charles Shillings,

Chicago, Illinois

PARKE & LACY COMPANY

21 and 23 FREMONT STREET, SAN FRANCISCO, CAL.

LICENSEE FOR THE MANUFACTURE AND SALE OF

The Huntington Centrifugal Roller Quartz Mill



The Construction of this mill has lately been much improved and we claim it to be the CHEAPEST, MOST EFFICIENT, SIMPLEST, AND MOST DURABLE MILL UPON THE MARKET.

Agents for Knowles' Pumps and Pulsometer Pumps

CATALOGUE UPON APPLICATION

Los Angeles, Cal. Office, 306 Byrne Building, W. H. Miller, Representative



RT. LOUIS, MO.

JOHN STEWART

MINING ENGINEER

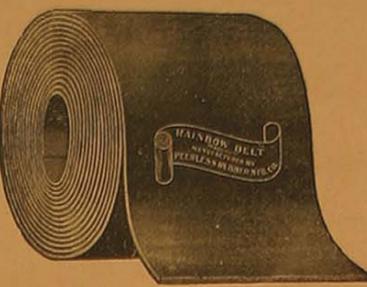
Address—Mining and Metallurgical Journal
LOS ANGELES, CAL.

Examines and Reports on Mineral Properties
Assessment Work Performed for Non-Residents

RAINBOW BELTING

A RED RUBBER BELTING, made from the celebrated Rainbow composition, which is peculiarly adapted for Dry Climates, is not affected by Dampness and especially designed for heavy service. Every belt tested before leaving factory.

500,000 Feet Sold During 1889
Not a single Belt Returned



Also try the well known "Peerless" Brands. Air Drill, Steam, Water, Suction, Fire Hose. Rainbow Sheet Packing. Peerless Piston Packing, Honest John Packing, Hercules Metallic Stop Valve Packing.

PATENTED AND MANUFACTURED
EXCLUSIVELY BY

The Peerless Rubber Mfg. Co., 16 WARREN STREET, NEW YORK

16-24 Woodward Avenue, Detroit, Mich. 202-210 S. Water Street, Chicago, Ill.
Dunham, Carrigan & Hayden Co., San Francisco, Cal.

California Vigorit Powder Co.

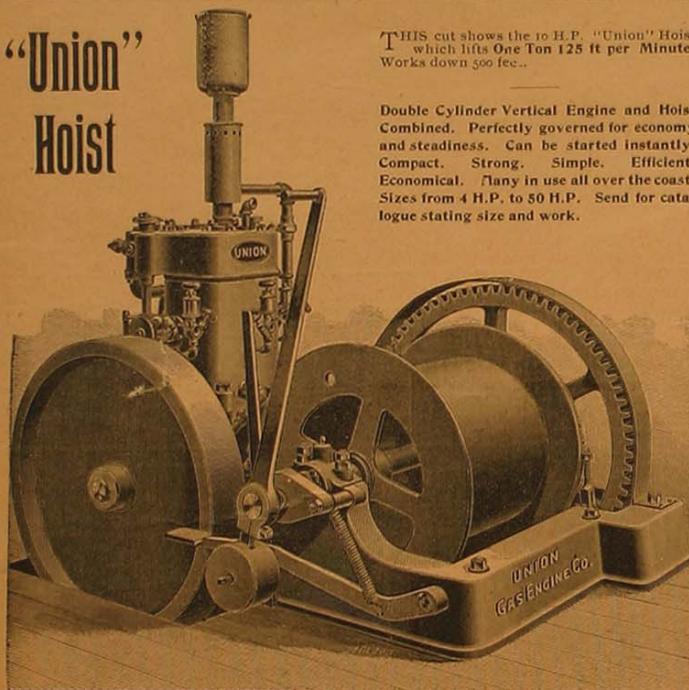
Manufacturers of

Dynamite High Explosives and "Vigorit Low" Blasting Powder

OFFICE: 208 California Street,
San Francisco, Cal.

WORKS: Point Isabel,
Contra Costa Co., Cal.

"Union"
Hoist



THIS cut shows the 10 H.P. "Union" Hoist
which lifts One Ton 125 ft per Minute.
Works down 500 feet..

Double Cylinder Vertical Engine and Hoist Combined. Perfectly governed for economy and steadiness. Can be started instantly. Compact. Strong. Simple. Efficient. Economical. Many in use all over the coast. Sizes from 4 H.P. to 50 H.P. Send for catalogue stating size and work.

Union Gas Engine Co.,
301 Howard Street, - - - San Francisco, Cal.

The only Genuine ALBANY GREASE has this TRADE MARK on every package. Look out for Yellow Label.



MANUFACTURERS OF

Albany Dynamo & Albany Cylinder Oils
If you are not using these Oils give them a trial at once, and we know the result. You will want no other

ALBANY GREASE

Lubricates Everything

Especially Adapted to Mining and Milling Machinery.

MADE ONLY BY
ADAM COOK'S SONS,
311 WEST ST., NEW YORK.
BRANCHES:

TATUM & BOWEN,
34 Fremont Street, San Francisco, Cal.
42-49 First St., Portland, Oregon.
—o—
55 So. Canal Street, Chicago, Illinois.

THOMPSON & BOYLE CO.

(Incorporated)

MANUFACTURERS OF

STEEL MINING PIPE

Cyanide Tanks, Water Tanks, Air Pipe,
Hydraulic Mining Material

310-314 Requena St.,

Los Angeles, Cal.

WILLIAM H. EMANUEL,

REPRESENTING

RAND DRILL COMPANY,
THE EDW P. ALLIS CO.,

Air Drills and Compressors
General Mining, Milling and Smelting

TRENTON IRON CO.,

Machinery and Reynolds Corliss Engine

HENRY R. WORTHINGTON,

Wire Rope and Bleichert Tramways

ROBIN'S BELT CONVEYOR

COLORADO

The Baker & Adamson Chemical Co.

MANUFACTURERS OF

Strictly Chemically Pure Acids and
Chemicals and Ashless Filter
Papers

RASTON, PENNSYLVANIA



Cream of the Trade

The Standard Authority

One Volume, Small Quarto, 313 Pages, 72 Illustrations, \$5.00.

A Practical Treatise on
Hydraulic Mining in California

By AUG. J. BOWIE, JR., Mining Engineer

CONTENTS

The Records of Gold Washing. General Topography and Geology of California; The Distribution of Gold and Deposits, and the Value of Different States; Account of Workable Gravel Remaining in California; Preliminary Investigations; Reservoirs and Dams; Measurement of Flowing Waters; Ditches; Plows; Various Mechanical Appliances; Blasting Gravel Banks; Tunnels and Sluices; Tailings and Dump; Washing or Hydraulicking; Distribution of Gold in Sluices; Loss of Gold and Quicksilver; Duty of the Miner's Inch; Statistics of the Costs of Working, and the Yield of Gravel. (3)

D. VAN NOSTRAND CO., Publishers

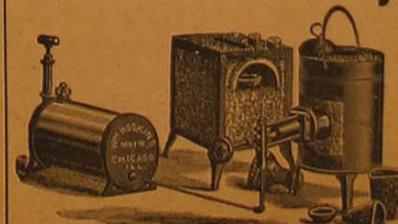
23 Murray and 27 Warren Sts., NEW YORK
Copies sent by mail or express on receipt of price



THE JOURNAL's advertising pages represent the cream of the trade, and nearly everything needed by miners, millmen and smelters can be found in them; in fact they constitute the best directory published in the West of mining machinery manufacturers.

Hoskins' Patent Hydro-Carbon

**Blow-Pipe and
Assay Furnaces**



No dust. No ashes. Cheap, effective, economical, portable and automatic. Send for Price-List to

W.M. HOSKINS,

81 South Clark St., Room 57
CHICAGO, ILL.

CHAS. C. MOORE & CO.

ENGINEERS AND DEALERS IN

BABCOCK & WILCOX BOILERS.
 McINTOSH & SEYMORE ENGINES,
 HAMILTON CORLISS ENGINES,
 N. Y. SAFETY AUTOMATIC ENGINES.
 GOUBERT FEED WATER HEATERS,
 STRATTON STEAM SEPARATORS,
 SNOW STEAM PUMPS,
 QUIMBY SCREW PUMPS,

GREEN'S ECONOMIZERS,
 WHEELER CONDENSERS,
 BARNARD-WHEELER COOLING TOWERS,
 HOPPES LIVE STEAM PURIFIERS
 EDMISTON FEED WATER FILTERS,
 BUNDY STEAM TRAPS,
 SPENCER DAMPER REGULATORS,
 HYATT ROLLER BEARINGS.

Watch this Space for description of the above Machinery.

Send for Catalogue and Full Information.

32 First Street, San Francisco, Cal.

GOODYEAR
Rubber Company.

GATHERING RUBBER. Crack Proof Boots, White Rubber Coats, Oil Clothing

RUBBER GOODS
 — FOR —
Miners & Mining

BELTING, PACKING AND HOSE

573, 575, 579 Market Street, R. H. PEASE, 73 and 75 First St.
 SAN FRANCISCO. CAL. Vice President and General Manager. PORTLAND, OREGON

Established 1872.
F. E. BRANDIS, SONS & CO.,
 ENGINEERING
INSTRUMENTS
 FOR ALL PURPOSES.
 312-814 GATES AVE., BROOKLYN, N.Y.
 Catalogues mailed on application.

All those interested
IN MINING
 Should Join the
SOUTHERN CALIFORNIA BRANCH
 of the
 California Miners' Association
 Secretary's Office:
 420 Stimson Block. Los Angeles, Cal.

JENA Trade Mark
 Normal Glass
 • SCHOTT & GEN. BEST GLASS FOR Laboratory use
 • CHEMICALS AND CHEMICAL APPARATUS
 ASSAY BALANCES Finest Ever Made
 Specialties:—Analytical Portable Balances, Porcelainware, Platinum goods, Crucibles, Cupels, Scorifiers, Muffles, Furnaces, C. P. Acids, etc.
 Everything Necessary for Assayers
 Elmer & Amend,
 3d Ave. Cor. of 18th St. New York

MATHISON & CO.
 25-27 CEDAR ST., NEW YORK CITY
 -- ANTIMONY --

BUY
 ANTIMONY ORES AND
 CRUDE ANTIMONY * WRITE FOR FULL PARTICULARS

The Colorado and California Mineral Developing Company

432-3-4 STIMSON BLOCK, LOS ANGELES, CAL.

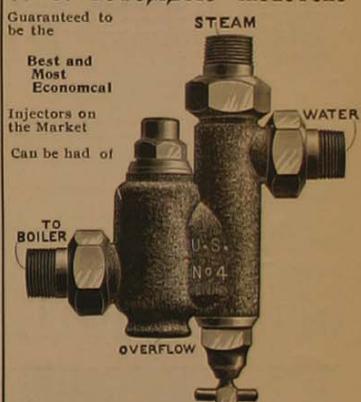
Prospecting, Developing of Mines, Mine Operators, Locating, Buying and Selling of Mines a Specialty, Financial Agents for Eastern Capitalists.

GAII, BORDEN, President
 J. A. COMER, Vice-President
 J. K. HAWK, Secretary

CAPITAL STOCK, \$200,000

Correspondence Solicited

U. S. AUTOMATIC INJECTORS



Mitchell Staver & Lewis Co., Portland, Or.
 Mitchell Staver & Lewis Co., Seattle, Wash.
 Schaw-Ingram Batcher Co., Sacramento, Cal.
 Henshaw, Bulkley & Co., San Francisco, Cal.
 And of Jobbers and Dealers generally.
 Catalogue Free.

American Injector Co., Detroit, Mich
 U. S. A.



THE MAIT DRY GOLD SAVER

was invented and patented by a man who has followed mining in California since the early 50's, and is the only thoroughly practical "DRY WASHER" ever invented, will save a larger per cent. of gold than any other machine. It is Cheap, Light and Durable, runs easy, will not blow the gold off. Can be easily carried and packed.

The material used in its construction is of the best, and is well bolted and screwed(not nailed)together, and is easily taken apart. Woodwork is of spruce and poplar; castings, iron and brass; lining, galvanized iron; riffle screen, No. 70 mesh, brass wire; hopper screen $\frac{1}{4}$ in. mesh, well secured, fans galvanized iron.

PRICES, Prospector \$15; Small Size \$35; Medium Size \$40; Large Size \$50. Any amount of References given.

A. G. GODFREY, Manufacturer,

311½ West Seventh St., Los Angeles, Cal.

A NEW MORTAR

That is a crusher and pulverizer combined

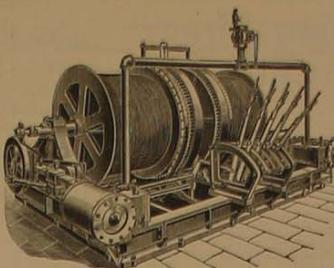


Weight 110 lbs.; Diameter 10½ in.; Height 8½ in.
Fills a long-felt want. Send for descriptive
circular. Crusher Pulverizer No. 1, \$25.00.

J. E. Surman & Co., 74 Cortlandt St., New York

Lidgerwood Hoisting Engines

Built to gauge on the Duplicate Part System. Quick Delivery Assured.



Mine Hoists,

STEAM AND ELECTRIC

CABLEWAYS Hoisting and Conveying Devices

SEND FOR CATALOGUE

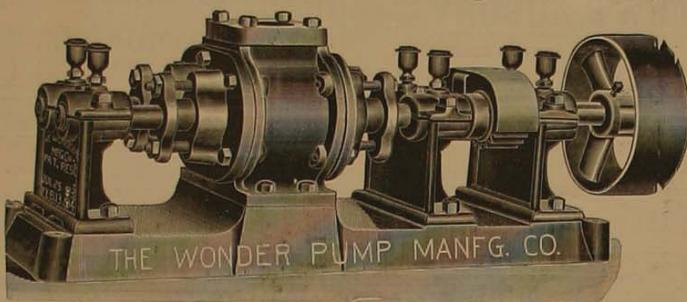
Lidgerwood Mfg. Co.

96 Liberty Street,

New York

HENSHAW, BULKLEY & CO., Agents, San Francisco.

The Improved WONDER Irrigation Pump



We also Build Vertical Style for Mining Purposes.
Write for full particulars and Catalogue.

Wonder Pump Mfg. Co.,

MACHINERY & ELECTRICAL CO., Los Angeles, Cal., Agents for California.

KANSAS CITY,
Missouri.

Sulphuric Acid

Also Strictly Chemically Pure

AMMONIA and

for Laboratory Use and Fine Chemical Work.

* SCHOOL OF *

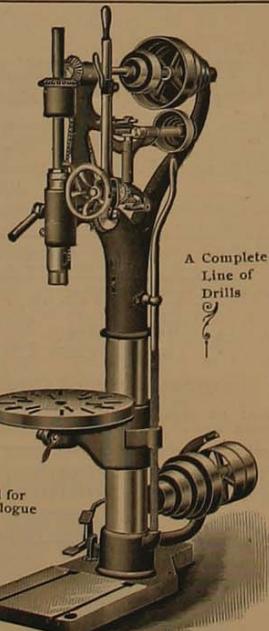
Practical Mining, Civil, Mechanical, Electrical Engineering, Metallurgy, Cyanide Process, &c. Surveying, Architecture, Drawing and Assaying. 933 MARKET ST. SAN FRANCISCO, CAL. OPEN ALL YEAR.

A. VAN DER NAILLEN, President. Assaying of Ores, \$25; Bullion and Chlorination Assay, \$25; Blowpipe Assay \$10. Full Course of Assaying, \$50. Established 1864.

Send for Circular.

C. P. Acids

Manufactured by the Denver, Col., Western Chemical Co. For Chlorination, Refining and other processes. Also Muratic and Nitric Acids, Blue Vitriol, Copperas Refined Sulphate of Soda, Etc.



A Complete Line of Drills

Send for Catalogue

UPRIGHT DRILL

THAT ARE MADE BY

W. F. & JOHN BARNES CO.,
105 Ruby Street, Rockford, Ill.
ARE SOLD IN
San Francisco by
HENSHAW, BUCKLEY & CO.

Our Stamp Mills from 500 lbs to 1,000 lbs. Stamps are strictly up to date. Furnished with Steel or Semi-steel wearing parts, heavy mortars of late improved design, with or without steel linings, as desired, and the Davis Patent Self-Tightening Cams of High-Grade Open-Hearth Steel, and High-Grade Forged-Steel Cam Shafts and Stems.

They are designed with great care by engineers familiar with the best previous practice and knowing just what is wanted to render satisfactory service.

Send for Catalogue and Prices.

Why SEND YOUR MONEY EAST FOR

Shoes and Dies, Cams Tappets, Car Wheels, Shafting, Hangers, Pulleys, Ore Cars and Iron and Brass Castings, when they can be obtained for the same price and in less than half the time

AT THE

Albuquerque Foundry and Machine Works,

Repairing of Mill and Mining Machinery a Specialty Albuquerque, New Mexico

Advertise your ...

* WANTS *

In THE JOURNAL

I. C. YAWGER, SUCCESSION TO VICTOR BISHOP & CO.

IMPORTER OF CARBONS FOR DIAMOND DRILLS.

MACHINERY NEW AND 2ND HAND

FOR SALE CHEAP
Hoisting Engines, Air Compressors, Rock Drills, Crushers, Dump Cars, Steam Shovels, Light Locomotives, Relaying Rail, etc. Send for printed leaflet just issued.

WILLIS SHAW, 629 N.Y. Life Bldg., CHICAGO

Reliable Assays

Gold	\$.50	Copper	\$.00
Silver	\$.50	Gold, Silver and Lead	1.25
Gold & Silver	.75	Gold, Silver, & Copper	1.50
Lead	.50	Gold, silver, copper, lead	2.00
		Samples by mail receive prompt attention.	
		Highest price paid for Bullion.	

Ogden Assay Co.,

Denver, Colo.

UNFAIR COMPETITION

Our recent announcement that inferior goods had been sold and billed on the Coast as our goods, and that our trademark numbers had been counterfeited, has disclosed an even greater extent of these practices than we had supposed to exist. To make the resulting damage to the reputation of our goods as small as possible and to protect our would-be patrons we repeat:

All our catalogue goods, except those listed by us as manufactured by others, are stamped with our name "Keuffel & Esser Co." or our initials "K. & E. Co." and where there is room for it, with our trademark. Our German drawing instruments bear only the trademarks  or  We never stamp our goods with catalogue numbers only, and goods so stamped are therefore not ours. All our  goods are fully warranted to conform to the description we give of them in our catalogue and to be of the quality and grade specified. We make some lines of cheaper goods for the jobbing trade, but they differ from our catalogue goods in quality and appearance. These inferior goods are not stamped with any of our trademarks. Our catalogue goods are not furnished to any dealer or agent without our complete stamp as described above, and any claim that we furnish our catalogue goods by special arrangement without our stamp is therefore an attempt to deceive. Our special papers in rolls or sheets

Duplex Universal Anvil Paragon Normal

are watermarked or stamped along the edge with their name. Any claims that our papers are furnished by us in bulk without these names or that these papers have been obtained otherwise than through us, are absolutely false. We will thankfully accept any information bearing on the counterfeiting of our trademark numbers or the palming off of other goods as ours.

Very respectfully, KEUFFEL & ESSER CO., New York

LINK-BELT Elevators and Conveyors



Coal Conveyor, 328 ft. center
handling 4 tons run of
mine coal per minute

The Link-Belt Machinery Co.

ENGINEERS, FOUNDERS, MACHINISTS

CHICAGO, U. S. A.

SEND FOR CATALOGUE

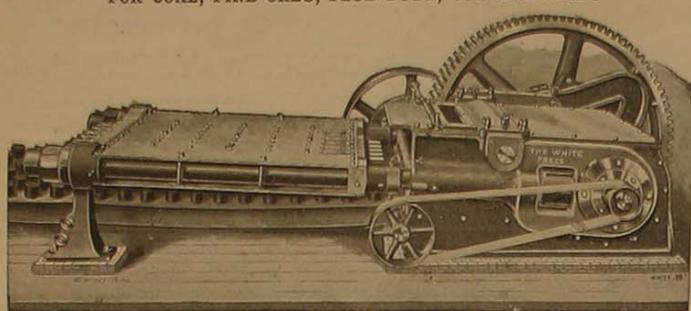
DENVER:

1328 17th Street

A. E. LINDROOTH, Manager

The White Briquetting Press

FOR COAL, FINE ORES, FLUE DUST, CONCENTRATES



SOLE LICENSEES TO SELL AND OPERATE

The Henry S. Mould Company,

Carnegie Building

PITTSBURG, PA., U. S. A.



The Gold and Silver Extraction Co.

OF AMERICA, (Limited)

Capital \$550,000

The Original Cyanide Process, Simple, Reliable, Economical
Mine owners and others having Refactory and Low Grade Gold and Silver Ores, Samples should have their material tested by
The MACARTHUR-FORREST PATENT CYANIDE PROCESS
Samples assayed and fully reported upon. Properties examined.
Designs furnished. Particulars upon application.

GEO. A. ANDERSON, Gen. Mgr.

210 McPhee Building, Denver, Colorado

Information, estimates, etc. cheerfully given. JESSE J. MacDONALD, Agent,
Care B. T. Calkins, 127 W. 1st St., Los Angeles, Cal.

Miners Attention!

We Sell Powder, Caps, and Fuse, **Mining Machinery**, Belting, Asbestos Goods, packing of all kinds, Picks and Shovels, Iron and Steel; Iron Wheelbarrows, Ore Sacks, Tents, Portable Forges and General Mining Supplies. Agency Truax Mfg. Co and Studabaker Wagons.

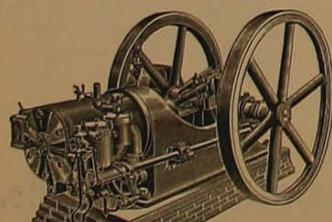
WILCOX & ROSE CO.,

San Bernardino, Cal.



LAMBERT

Gas, Gasoline and Distillate Engines



TANKS, PIPE and WATER SUPPLY GOODS PUMPS of all kinds.

Call on or Address,

S. J. Smith,

230 E. Fourth Street,

LOS ANGELES, CAL.

ESTABLISHED 1820
YOUNG & SONS.
Manufacturers of

Engineering, Mining and Surveying Instruments
Noted improvements in Auxiliary Telescopes
for vertical sighting in mines. Makers of the
inclined standard transit. Non-Extension
Telescopes, moisture and dust proof. Write for
special circulars of mining transits.

43 N. Seventh St., Philadelphia, Penn.

SAVE MONEY! FUEL COSTS MONEY



Protect your pipes and boilers with Wm. Berkfeld's Fossil meal composition, packed in sacks, easy to transport anywhere. Send for facts and figures.

FOSSIL MEAL CO.,
2 Cedar Street, New York

Mining Supplies and Steel

Blacksmiths and Machinists Supplies of all kinds.

Iron and Heavy Hardware, Wood Materials, Wheels, Hardware &c., for heavy freight wagons. Blacksmiths and Wagonmakers Tools and Machines. Send for complete catalogues.

S. D. KIMBARK,

80-82-84 Michigan Ave., Chicago, III.

Assay Office
LEWE AUBURY, E.M.

115 West 1st Street,
Opp. Natick House LOS ANGELES, CAL.

W. O. ABBOTT, ASSAYER

ASSAYING IN ALL ITS BRANCHES
CHEMICAL DETERMINATIONS ACCURATELY MADE

TOMBSTONE - - - - ARIZONA

CARRIAGE AND BUCKET OF THE

HALL
PATENT

Cable Hoist CONVEYOR

FOR

Excavating Canals and Trenches.

Used in Excavating the Suwanee Canal, Georgia. Only system with a bucket that is absolutely self-filling. Also adapted to the construction of levees and embankments.

THE TRENTON IRON CO., Trenton, N. J., MANUFACTURERS.

Also Wire Rope Tramways, Surface and Underground Haulage Plants, etc. Wire Rope of all kinds for regular and special applications. Illustrated Pamphlet on application.

NEW YORK OFFICE—Cooper, Hewitt & Co., 17 Burling Slip.
CHICAGO OFFICE—1114 Monadnock Building.

W. H. EMANUEL, Agent, Denver, Col. 5 NEWTON M. BELL, Agent, San Francisco.

SEE Incorporated Mines Paying Dividends Page 22

WM. M. COURTIS, A. M.

Mining and Metallurgical Engineer

Assayer and Analytical Chemist

Office: 412 Hammond Building, Permanent Address, 449 4th Ave. Detroit, Mich.

Assay Office and Ore Testing Laboratory
OF HENRY E. WOOD, Assayer

1734 ARAPAHOE ST., DENVER, COLORADO

Established in Colorado in 1876

Control and Umpire Assays a Specialty. Wilfley Concentrator in Operation. Write for circular giving prices, etc.

HADFIELD'S MANANESE STEEL, HARD, TOUCH.



Best Metal known for Stamp Shoes and Dies, Roll Shells, Crusher Plates and Side Liners. Toggle and Toggle Bearings, Gyrotary Cones and Concaves or Liners, Mine Car Wheels, Coal Crushing Rolls, Etc., Etc.

TAYLOR IRON AND STEEL CO.,

Sole Licensees in America under Hadfield System and Patents. High Bridge, N. J., U. S. A.
All Pacific Coast parties interested please address, Parke & Lacy Co., San Francisco, Cal.

The Mining And Metallurgical Journal

ENTERED AT THE POST OFFICE AS LOS ANGELES, CALIFORNIA
AS SECOND CLASS MAIL MATTER.

VOL. XXI. JULY 1, 1899. NO. 7.

F. W. EDELBESTEN, Editor.

O. S. BREESE, Business Manager.

JOHN STEWART, Special Contributor.

ULRICH KNOCH, Publisher

MAIN OFFICES

Stimson Block, Los Angeles, Cal.

150 Nassau St., New York, N. Y.

BRANCH OFFICES:

San Francisco, Cal.	64-65 Merchants Exchange
Chicago, Ill.	413, 59 Dearborn St.
Denver, Colo.	402-403 Quincy Bldg.
Salt Lake City, Utah	15 W. Second South St.
Spokane, Wash.	Hypotheek Bank Bldg.
City of Mexico, Mexico	No. 4 Calle de San Juan de Leiran

SUBSCRIPTION PRICE:	
For United States, Mexico and Canada.....	\$2.50 per annum
" " "	1.25 six months
All other countries in the postal union.....	3.50 per annum
" " "	1.75 six months

NOTICE TO SUBSCRIBERS.

Subscribers not receiving their copy of the JOURNAL regularly, whether ordering through agent or direct, will kindly notify the Los Angeles, Cal., office.

ISSUED SEMI-MONTHLY

ADVERTISING RATES FURNISHED ON APPLICATION.

FORESTRY AND MINING.

The natural subdivision of the land of any civilized country is best classified under the headings of agricultural timber and mining rights. Until very recent years the government of the United States has left the care of the timber and mining resources in the destructive and improvident trust of individual ownership. The result is that on account of the perishable nature of the timber supply and its slow rate of reproduction the required amount has rapidly vanished and in many sections is gone altogether. The effect of this has been felt on the climate of the country in diminishing the rainfall and making the amount of it that did come find its way to the rivers and streams in a shorter space of time, and in consequence that moisture which fell was not retained in the soil and rocks and has rendered some sections, such as the southwestern States, more arid than it was formerly. For these reasons the timber area of the country has an important bearing on the development of the mining resources of any district. There are large sections of the southwest that at one time were covered with timber which was destroyed by cattlemen and sheepmen and at times by the miners, as the government took no interest in forestry in those days. This destruction took place both in the mountains and what is now called the desert. Forest reserves have been fortunately set apart on the mountain sections, but that act does not now prohibit prospecting or mining within the limits of such reserves (except Yosemite) as was stated that it did under "Concentrates" in the *Mining and Scientific Press* of 20th of May last, page 531, where it is said: "The laws do not permit the location of mineral or other claims on any government reservations, whether military, forest reserve or Indian." The words "forest reserve" ought to have been left out.

The restoration or reforesting of the burnt forest areas in mountain and desert sections has an important bearing on the water supply and aids mining in such sections. In the des-

ert sections there have been valuable groves of mesquite timber which have been destroyed as above stated, and efforts should be made by each county to reforest or replant such places. The mesquite timber has several varieties and grows on the desert in Arizona and California from the sea level along the valleys of the Colorado, Salt and Gila rivers to an elevation of 3200 feet, as at Newberry on the A. & P. R. R., Santa Fe line, where there was at one time a large grove which was cut down to supply fuel for the silver mines in Calico, when our laws or the Bank of England permitted our miners to indulge in the luxury of mining silver ore. So far as known no effort has been made by our experimental stations to grow this valuable cattle food and fuel producing tree. The pods of this tree have a taste similar to sweet corn and seem to ripen at almost all seasons of the year and furnish food in the Arizona and California desert valley sections for the Indians and for cattle and horses. The presence of excessive alkali does not apparently kill the tree, and it seems to flourish where nothing else would grow that cattle would subsist on and get fat. Professor Wickson of Berkeley is authority for the statement that the date palm will subsist on moist alkali soil and that salt is the proper fertilizer for this tree. If this statement is true there are large areas in the desert where alkali and salt water and moist land are found and where experimental trials could be made with these two representatives of native and foreign desert trees. To make such sections fit for habitation would increase the area of forests and open up settlements in the districts where minerals could be made available. The addition of any valuable tree from the interior or inland sections of Australia might have as good results to our desert sections as the introduction of the eucalyptus family has been to the coast districts of California. The approaching meeting of the American Forestry Association, which is to be held in Los Angeles during the month will be attended by Lew E. Aubury, E. M., and O. S. Breese of the JOURNAL, who have recently been appointed by President J. H. Neff as delegates to represent the California Miners' Association at the sessions.

PATENT PROCESSES.

The inventor of the patent process for extracting metals from their ores by the use of a set formula aims at securing his supposed discovery from general use by taking out a patent for it. In such a case the formula must be adhered to or the conditions of the patent are not carried out. The intention of the inventor is to use a set combination of chemical reagents to accomplish the reduction of the metals in the ores to the metallic condition. As almost all ores of the same class differ from one another, such a process must have a small application limited to only those of the same chemical composition and physical properties or the formula of the process has to be changed to suit the case or it will not have the desired effect. The question then arises, how far can a patent process be made to stretch to suit altered ore conditions and still hold good? In the case of one class of ore a dilute solution is only necessary, but with that of a higher grade or containing a larger percentage of metal or other refractory substances an increased amount of the reducing agent or precipitant is required to effect the change. The use of the formula would not be complied

with and the patent would not apply. If the patent covered the use of certain chemicals in both large and small amounts the case would be different, as the discovery or invention would then consist of the new application of the substance for that purpose for which it had never been used before. The power of cyanide of potassium in solution to dissolve gold was long known before the invention of the MacArthur-Forrest process, which used it in that way on ore and accomplished the precipitation of the gold by the use of zinc shavings, etc. That was a case of patenting a process of ore reduction, not a set formula. It is the variation in ores of the same metal and at times the climatic or local conditions at the mine that often render a process of ore treatment unworkable or not practicable of application in every instance. Consequently the patenting of ore reduction processes is a common custom, and ignorance of chemical laws causes fake processes to be introduced over which the patent office does not or cannot keep a restraining power to grant only those which are tested and proven useful and good. To gain the confidence of the mine owners to experiment on their ores is the great difficulty in introducing a new process, as the worthless are as much canvassed and advertised as the good until their merits become known.

CALIFORNIA AND COLORADO.

California and Colorado are the two oldest and most extensive mining States in the west, and consequently ought to set the example and be models in methods of working for other sections. Colorado in recent years is making rapid strides to accomplish that end. At the last session of its Legislature an amended mining law was approved and will take effect on the 9th inst. The California Legislature attempted to pass a bill at its last session regulating mining and appointing an inspector of mines, but the bill did not become a law on account of not receiving the signature of the State Governor. The extent and importance of the industry in both States renders mining regulations and inspection under the officials of the State Mining Bureaus a matter of necessity for the welfare of the industry and of the interests of those employed and operating mines. As the minerals of a State are the inheritance of the people in present and future times, wise rules and regulations must be enacted and enforced. The area or extent and value of the agricultural land in a State can be increased by reclaiming land from the sea and rivers and in bringing water to the desert sections, but the extent of the mineral resources of a State cannot be increased, hence the necessity for making all minerals the property of the people and regulating their manner of working, so as to receive the most benefit in present and future years, and encourage deep mining. The increasing commerce of the western States with the east and the Orient demands that the neglect of the mineral interests of the State of California by those in office shall cease. The large increase in exports of metallic products has given a value to some western minerals which they did not formerly possess, and gives opportunity for establishing manufacturing industries in the west. The careful perusal of the new Colorado mining law can be undertaken with instruction and profit by the lawmakers of California who in former years have made rules but furnished no means of enforcing them or inspection to see that they were in operation. In

this respect the full benefit of the State Mining Bureau has not been made available to the industry as it has in Colorado and Montana, and will be more so in the former State under the new mining law.

DRINKING WATER FOR MINERS.

As the warm season of the year has arrived in the mining sections of the southwest, it is the duty of the manager or owner at all mines to see that a supply of pure drinking water is obtainable for surface and underground use by the employees. At too many mines no attention is paid to the drinking water, and as a result the vile compound called by that name is not fit for human consumption. The use of filters is of benefit in such cases where it is liable to contain organic impurities, as they cost little and can be kept efficient and clean by changing the material used as filtering agent. Boiled or condensed water is better than that which is impure, but has a flat, unrefreshing taste to which many object. In the desert districts a miner at work will consume two gallons of water per day in the hot season, so it is of importance to have the supply as pure as it is possible to obtain it, for if otherwise the danger to health is sure to make its damaging effect felt. The healthy condition of the employees of a mine has a wonderful effect upon the amount of work they can perform, so it is to the interest of the owner or manager to see that the hygienic influences of good air and pure drinking water are the best that can be obtained.

OPENING A MINE.

When the shaft of the mine is sunk on the vein or deposit in the early stages of the development, the error is of too common occurrence to find that the ore on the sides of the shaft has been stoped out, because it was easy of access and conveniently mined at small cost. This is generally the prospector's first error, as the desire for ore is in excess of the means at hand of acquiring it at greater depth, and on that account prospect shafts are seldom suitable for the main working shaft of the mine. When a shaft cuts or passes through an ore chute on the vein when the mine has passed the prospect stage, the temptation is presented to extract the rich ore on the sides of the shaft. If there are no mining regulations in the district or no mine inspector to enforce them, or to prohibit such manner of working, these errors are sure to happen. The shaft of a mine whether on or off the vein is the entrance to the workings and should be used for that purpose alone and not for the object of stoping ore from its sides, which operation renders it unsafe and more liable to falls of roof or wall rock, which are liable at any time to block the entrance. If it is sunk on the vein, a suitable amount of ore, say ten to twenty-five feet, depending on the strength of the ground, should be left on each side of the shaft before any stoping of ore is permitted. It is also a wise provision to leave the first fifty or more feet in depth from the surface which forms the back of the vein as a support to the loose surface wall rocks and that constitutes the roof of the mine and protects the workings from summer heat and winter rain. The neglect of making this provision has made future working more expensive and ruined many mines, by admitting surface water and falls of rock into the mine. The amount of ore left in the first fifty or more feet on the back of the vein and in the ore

reserved in the ten to twenty feet on each side of the shaft is not lost, for if the mine in future becomes exhausted in depth, these ore reserves always remain in sight as an asset which is available and can be extracted before the workings are abandoned, and it is the wisest plan to leave such parts to the last operation of the mine instead of the first stages of development, as is too often the case.

STRIFE FOR GOLD.

In ornamental work and in more useful ways, the consumption of gold in arts and manufactures is immense. Less than one-half of the current production for many years has been reserved for the mints. As it is given a money function superior to that conferred on any other material makes it more potential than any other commodity. In the monetary world it enjoys an unrivaled monopoly. All the great civilized nations are struggling for its possession with as much energy as in achieving territorial aggrandizement.

The present age is more intensely commercial than any of its predecessors, and as with the preponderating nations, gold is the ultimate measure of value, its control has become of vital importance. There may be wars for conquest, for national independence and to correct internal abuses, but they are much more likely to grow directly or indirectly out of commercial rivalries. This is understood, and whether there shall be conflict of arms growing out of such rivalries or not, there will be contests for commercial advantages, and with the power which gold possesses, the nation which has the most will hold the best strategetic positions, hence it is being acquired and held as a kind of war store or material.

The four greatest nations of Europe have government banks, which are depositories of gold, and which control the government finances. Russia has by far the largest gold reserve, next France, then Germany and, lastly, Great Britain. The United States has no national bank which has any voice in its fiscal operations, and its gold reserve is held in the treasury department. In that department at the present time the gold reserve is greater than in the bank of England or of Germany, but is about \$150,000,000 less than in the bank of France, and not one-half as much as in the bank of Russia. The gold reserve in the United States treasury was nearly all acquired by the sale of bonds.

The struggle for gold at the present time is acute. The bank of England is buying gold in the United States to strengthen its reserve, not of the government but of private parties and institutions. The greatest rivalry is between Russia and Great Britain. The gold held by the banks of the four European nations named constitutes one third of the gold money of the world.

It has not always been easy for the bank of England to maintain gold payments for the government, nor to meet its own gold obligations, although for more than eighty years it has been compelled by law to purchase all the gold offered at a fixed price, which has not been required of any other European institution. This was intended to give it an advantage, and it has so proved. In addition to this, the British government long since adopted the policy of securing control of countries which produce gold, in order to gain advantage over commercial rivals. The outputs in Australia, Africa, British Columbia and some other countries

go into her coffers. This policy has been coincident with her efforts for trade with countries which consume her productions.

With her vast manufacturing industries and merchant marine, Great Britain has almost invariably been able to secure to herself favorable balances of trade, which has added immensely to her gold resources, and but for the fact that her citizens invest heavily in enterprises of other countries, she would today be in possession of perhaps more gold than all other nations. But as it is, Russia is richer in gold than Great Britain is.

Gold production in the United States is the largest in the world, and for the past three years trade balances have been heavily in her favor, but the United States is not in a position to very largely increase her gold holding. The government and people and corporations are debtors to foreign peoples, and consequently large sums are required to pay interest.

Americans spend more in travel and sojourn abroad than foreigners spend in this country. Another immense source of impoverishment is in the fact that foreigners do much the larger part of our transportation on the seas, which is estimated to be from \$100,000,000 to \$200,000,000 annually.

Should balances of trade be adverse to us for two or three years, even in small amounts, so far as gold resources are concerned, we would become greatly impoverished, if not practically bankrupt.

Aspiring as this country is to eminence in international trade, there must be changes in her business arrangements. First of all, provision must be made for doing our own transportation in foreign commerce, or as much for foreign people as they do for us. Another thing is to carry on American enterprises with American capital, so that all profits will be retained at home.

Without the avoidance of outgoes, such as these and some others, the United States will be outstripped in the contest for control of gold. It is not necessary that gold, or its representative, paper money, should be relied on to supply the means for conducting our own enterprises. What we use at home is not a matter that foreigners have a right to inquire into, as they are not interested.

If the gold measure must prevail in international transactions, our policy is to avoid expending abroad for what we can do for ourselves, and to so develop exports that trade balances will not be adverse to us.

PARSON-RICHARDSON MINERS' ASSOCIATION.

The above is the title of a communication which we have received from a prominent mining man of Los Angeles, Cal., but lack of space prevents us from giving it the publicity it deserves.

The letter treats upon the organization of an independent miners' association for "this southwestern region," (?) and the subject is spoken of from the standpoint of a miner, not the parasite which is disposed to make a living off the back of the mining industry of Southern California.

The article we reprint in another portion of this issue, taken from the San Francisco *Call*, is illustrative of the position taken by the Northern California people, as well as most all fair minded people of Southern California, except those who had an ax of their own to grind and failed to have it ground. Misrepresentation of facts and misquotation of opinion have served to create some attention, which would not have been accomplished otherwise.

QUICK TESTING OF LEAD-TIN AND LEAD-ANTIMONY ALLOYS.*

(BY JOSEPH RICHARDS.)

While great strides have been made in analytical chemistry, yet there is in the direction of quick work a field for the chemist that needs urgent attention, and as far as he has been able to meet this demand the metallurgist is benefitted by the progress made and the results attained. I allude to methods of quick determinations, approximately true and sufficiently so for the purpose required.

My own experience for the past thirty years has been confined almost exclusively to the working of the white metals, such as lead, tin, antimony, aluminum and zinc. It is well known that the bulk of the lead ores are contaminated with antimony, and in the refining of lead, the antimony when at a dull red heat is rapidly oxidized and floats on the top of the molten mass as scum, carrying particles of lead with it. This is removed as fast as formed, and in the course of ten to forty-eight hours all the antimony is eliminated.

It is very desirable in this process that the workman should know how he is progressing in his work; and in order to meet this demand I have made a series of tests of the relative weights of standard alloys of antimony and lead, from pure lead up to 24 per cent. antimony. At this point the lead is saturated, and if more than that quantity of antimony is present it will float on top of the molten mass; so that a standard alloy of 24 per cent. of antimony is the highest that can be tested by my apparatus. I made castings of these alloys in a mold, took the average weight of 10 of each grade, and the machine was marked to exactly balance at the line or weight given by the average test. This I continued from pure lead up to 24 per cent. antimony; thus a quick and reliable means is at hand, so that all the workman has to do is to carefully cast his bullet, place it on the balance, and it shows him at once the amount of antimony in the mixture. The following difficulty here arose: while antimony is lighter than lead, if a small amount of antimony is present (less than 2 per cent.), instead of making the bullet lighter, it is heavier than pure lead, and it is not until over 2 per cent. is present that its weight becomes less than that of lead. This difficulty I overcame by discovering that the physical properties of

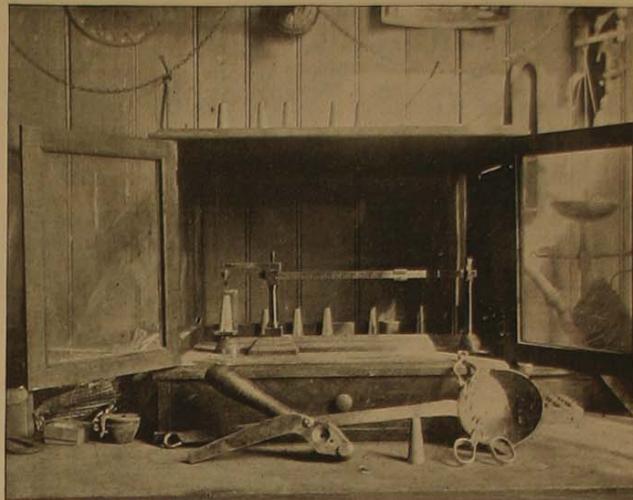
these alloys is such that if a small button is poured on a flat plate and allowed to cool, the surface is not at all like lead, but of a fine white crystalline appearance. So I have supplemented my test machine with a set of buttons of a known composition from 2 per cent. down to zero, changing composition by 1/10th per cent. in each button. I made the first button 2 per cent., the next 1 9/10ths and so on down to pure lead.

Thus the operator can go on with his work until there is a perfectly lustrous surface, free from frost, and at this point the lead will be 99 fine or over. The practical value of these tests is shown by the fact that since I made the first machine for the National Lead Company their order has been duplicated six times.

Another method of quick testing was needed for the alloys of lead and tin. When I commenced this business the only way I could find out the percentage of tin in solder, solder-joints, pewter and such like metals, of which we were buying hundreds of tons each year, was by chemical analysis, and I found this took several hours and required great care and much practice to get accurate results. The use of the specific gravity test was suggested to the writer by an old member of the Institute, Mr. G. H. Perkins, but the means employed were crude and unsatisfactory. So I again commenced with pure lead as a standard, taking 99 of lead to one of tin, and so on until I got up to pure tin. I made over 2,000 tests, confirmed them by analyses of the metals used, and so made a set of standard weights, from which standards the scale now before you was marked; each mark being the average of about twenty tests and is correct to the tenth part of 1 per cent. I may here remark that the weight of these alloy bullets is, for some physical reason, different from the calculated specific gravities of the alloys, some being heavier and some lighter than the calculated weights. The machine before you has a graded beam, and the moulds are all made to an exact standard and are all interchangeable. If a firm loses or breaks a part of the machine, it can be easily replaced or a new mould procured.

So that now, when we melt alloys of tin and lead, we do not even have to depend on accurate weighing of the metals to be melted, but test each pot and can check any error that the workman might have made in his weighing.

So accurate is this test that a difference of a quarter of 1 per cent. is easily detected, and my experience in my own



BALANCES FOR TESTING TIN-LEAD ALLOYS.

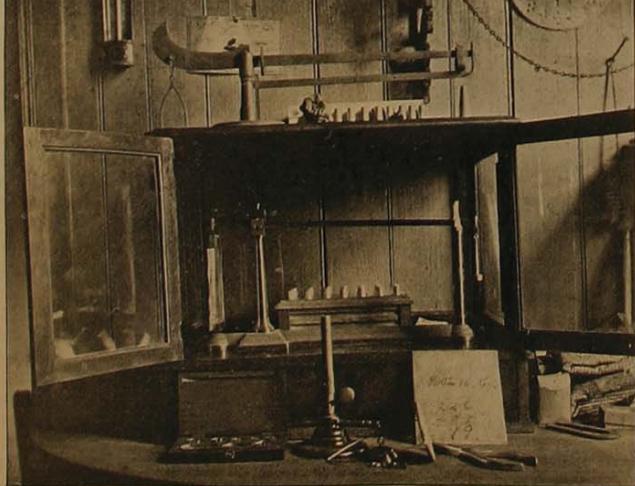
laboratory and with samples sent to a couple of good chemists, is that I would every time prefer my test for practical purposes to that of the ordinary chemical laboratory.

When we consider that many thousands of tons, roughly estimated at 75,000 of solder alone, are used in the arts every year, one may easily perceive how valuable a factor to the trade such a machine as this becomes, and it has been so recognized, for at this time at least nine-tenths of all the smelting and refining works in the United States are using my machine. Also in the new industry of manufacturing roofing plates with tin and lead alloy coating, called terne plates, I find that I have supplied three-fourths of the plants with these machines; so that they may test and keep regular the percentage of tin and lead in their bath. Many large purchasers of solder find such a testing machine indispensable to protect themselves from lower grade metals than they pay for. This simple, accurate and altogether satisfactory method of testing is therefore now in common use.

In my machine for testing roofing plates, the beam is so adjusted that if a piece of the sample plate exactly cut to template size and then weighed on the scale, gives the weight of a box of 20x28 plates in pounds. For instance, if the plate cut shows a weight of 220 pounds, that is the weight a box of plate would be with the coating on it. This piece of plate is then heated over a Bunsen burner till the coating melts, then wiped clean, heated again and wiped till no more metal is on the surface. When the surface is blue all over, showing that all the coating is removed, weigh it again. If it now weighs 200 pounds this will be the weight of the black plate per box and the difference between the two weighings is the weight of the coating in pounds.

Albany Grease.

Engineers in charge of fast running machinery recognize that the matter of expense for repair is a troublesome one and that a strictly pure lubricant is essential to keep the machinery in order. Those who have tried the Original Albany Grease manufactured by Adam Cook's Sons, 313 West street, New York, report splendid results in lubrication with a saving in repairs impossible where oil or mineral greases were formerly employed. Send for Circular.



MACHINE FOR TESTING TIN PLATE.

PHILADELPHIA EXPOSITION.

The National Export Exposition, to be held in Philadelphia from September 14th to November 30th, 1899, is being rapidly put in tangible shape for business. No exposition that has ever been held in the United States has been able to show three and one-half months in advance of its opening day such gratifying prospects of success as this one.

One of the most important acts of the executive officers in their recent meeting was the appointment of a committee to deal with matters pertaining to the great International Commercial Congress which is to be held in connection with the Exposition.

The committee named is as follows: Hon. G. F. Edmunds, chairman, formerly U. S. Senator from Pennsylvania; former Mayor of Philadelphia Chas. F. Warwick; Wm. L. Elkins, Justus C. Strawbridge, Daniel Baugh, Calvin Wells and Mrs. Sarah Y. Stevenson.

Dr. William P. Wilson, Director General of the Exposition, submitted a most important report, to the Board of Directors, giving all the necessary data with reference to the work that had already been accomplished by himself and subordinates, as well as what the management propose doing in the immediate future toward furthering the success of the project.

It is only in recent years that America has paid any attention to the export trade, and now the eyes of the large manufacturers are looking abroad for markets they never dreamed of before.

America leads in labor-saving machinery, and so can turn out nine-tenths of the common articles of commerce cheaper than can the other manufacturing countries of the world. Germany has studied the tastes and prejudices of buyers, savage or civilized, in every market of the world, studied them with the care that a scientist spends upon a new plant. And when Germany finally determined just what shape and quality of shoe or knife or hat was wanted, America has stepped in and made the article more cheaply than even Germany, with its cheap labor, could produce it.

America has proven her ability to do this almost every time, but in spite of this there are many markets to which American exports could be doubled, if the man who retailed the knife or shoe or hat

were but shown the samples and prices side by side. But, remarkable to say, there have been, until recently, manufacturers whose plants were fitted for such work, but who, with an exaggerated idea of the difficulties and dangers of trying for foreign trade, would not realize the golden possibilities of export. The phenomenal growth of our foreign trade in the last few years, and especially in 1898, when we took our place as the leading export

nation in the world, have roused some manufacturers in every branch of trade to the fact that the whole globe is a possible market for their wares.

But manufacturers who make goods for the home market alone generally take the stand, when discussing foreign markets, that they are not interested in export trade. In this they are in error. The export market is of vital importance to every manufacturer in the United States.

It is of special interest to manufacturers who do not export, because a good foreign market in other lines than those which they make, and for which there may not be a demand abroad, relieves congestion in the general home market.

Many instances might be cited to illustrate this point, but the thoughtful manufacture of products which are only sold in the United States will comprehend the importance

of foreign trade in this relation. Though his interest may not be direct, he should give every encouragement to the development of foreign markets, because through the relief which they give to home trade by absorbing surplus production he is deriving untold benefits.

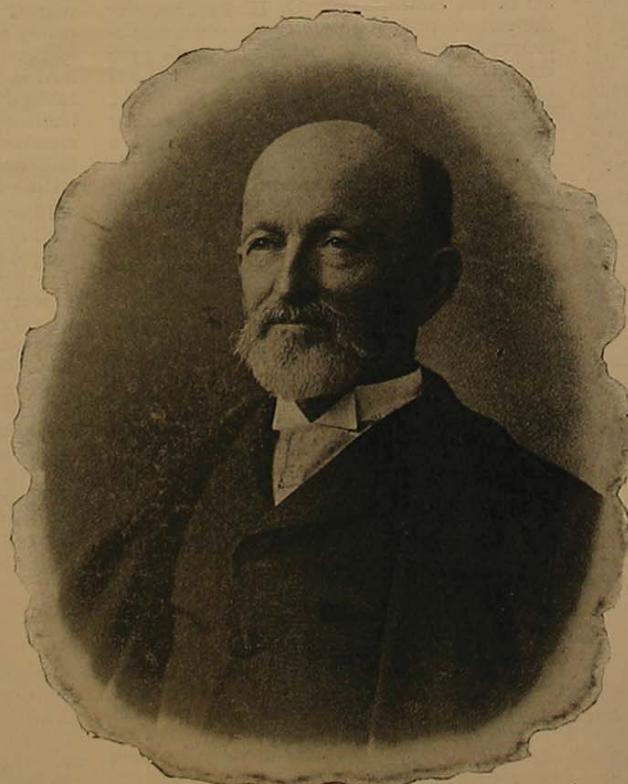
MAIN BUILDINGS.

The main building of the National Export Exposition will be imposing and beautiful. With three permanent pavilions, constructed of brick and steel, two stories in height, and a main exhibition hall nearly 300x400 feet in size, there will be an area of floor space in these buildings aggregating twelve and one-half acres.

The north pavilion is the one showing to the left of the picture. The main entrance opens to a lobby 60x90 feet, beyond which, and in the center of the temporary structure, lying between this and the central pavilion, will be the auditorium, 200 feet long and 140 feet wide, with a seating capacity of 5,000. Toward each end of the main facade will be smaller entrances, each of them flanked by pedestals, on which will be symbolic groups of statuary representing various industries. The pediments over the various entrances of all the buildings will contain heroic figures, symbolizing various aspects of manufacture and commerce. Opposite a smaller entrance in the northern permanent pavilion will be exhibition spaces and beyond arches leading into arcades for exhibits, each of which will be alongside the auditorium, each of



MAIN BUILDING, NATIONAL EXPORT EXPOSITION, SEPT. 14 TO NOV. 30, 1899.
Length, 1,000 feet; width, 400 feet; area of floor space, 12 acres.



CHARLES HENRY CRAMP,
President Philadelphia Museums and a Member of the Board of
Directors of the National Export
Exposition.

which will be 300 feet long and 80 feet wide. The stage and platform of the auditorium will take up about 100 feet of the 300 feet of space between the northern and center pavilions. The dimensions of each of the permanent pavilions will be 90x380 feet. Each will be two stories high, the second floor of the northern pavilion to be devoted to the offices of the administration and other departments of the exposition; the second floors of the other pavilions will be given up to exhibits. The dimensions of this main group of buildings are about 1,000x400 feet.

The portraits of the leaders of the National Export Exposition given herewith are excellent likenesses of those prominent gentlemen who are so well known as to need no special mention here, so the following will suffice.

been carried out, and the result has been very helpful to the commercial interests of this country.

The National Export Exposition, of which he is the director-general, will be under the auspices of the Commercial Museum and Franklin Institute, and it will do more to expand and extend the trade of this country than any other exposition ever held.

PETER A. B. WIDENER.

In 1874 he was appointed to serve out the unexpired term of Joseph Marcer as City Treasurer, and the following year was elected for a full term.

When he retired from the office he turned his attention to the development of street railroads. In 1875 he was among those who

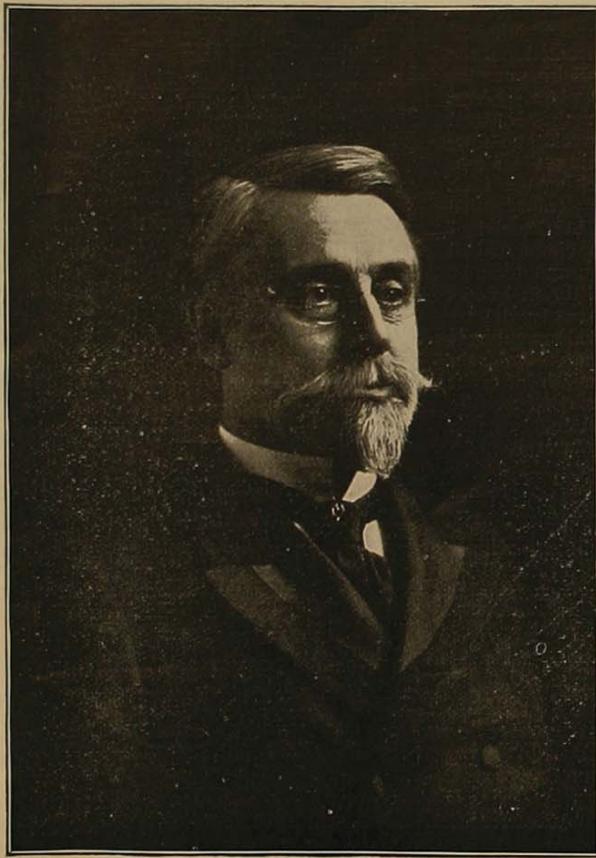
sioners of Fairmont Park, and is prominently identified with a number of other important enterprises in Philadelphia and elsewhere.

CHARLES H. CRAMP.

To succeed the late Dr. William Pepper as president of the Philadelphia Museums, the Board of Trustees chose Charles H. Cramp.

The name of Cramp has since 1830 been prominently identified with modern progress in the art of ship-building. In that year, William Cramp, the father of Charles Henry Cramp, founded on the Delaware River, in the northeastern section of Philadelphia, the plant that has since become one of the greatest ship-building concerns in the world.

Charles Henry Cramp became the head of this vast and celebrated industrial enterprise



DR. WM. P. WILSON,
Director-General National Export Exposition.

DR. WILLIAM P. WILSON.

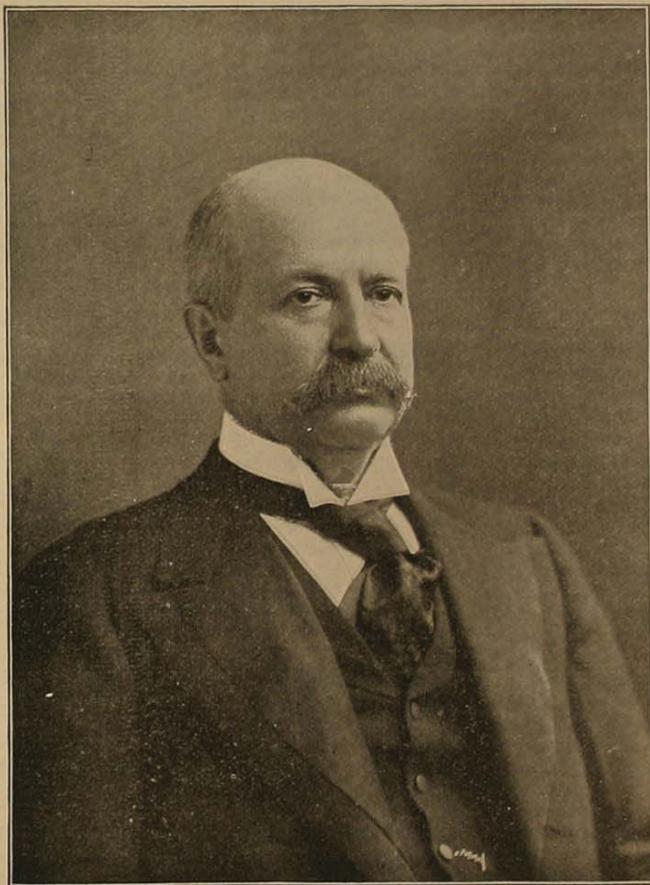
Dr. Wm. P. Wilson, director of the Philadelphia Commercial Museum, and director-general of the National Export Exposition, to be held in Philadelphia next fall, is a man of unusual intelligence and of marked executive ability.

In the year 1893 he conceived the idea of founding a commercial museum, using as a nucleus the raw products exhibited by different nations at the Chicago World's Fair. He secured authority from the city of Philadelphia, and succeeded in having donated for the proposed museum the large collections of natural products exhibited by nearly every country, and especially the Spanish-American countries. Since that time his plans for the successful organization of the museum have

secured the controlling interest in the most important system in Philadelphia—the Philadelphia Traction Company, which is now a leading feature of the city's present extensive and comprehensive electric traction system.

While Mr. Widener has been most assertively identified with this company, he is also a dominating factor in others of like nature in New York, Chicago, Baltimore and Pittsburgh. He and those directly interested with him have the control and direction of more lines of street railway than any other syndicate in this country.

Besides being president of the Exposition Association and a member of the Board of Trustees of the Philadelphia Museums, Peter A. B. Widener is an active director in many street car corporations, one of the commis-



P. A. B. WIDENER,
President National Export Exposition.

after the decease of his father in July, 1879, and which in 1872 had been incorporated under the title of The William Cramp & Sons' Ship and Engine Building Co.

As a director of the Exposition Association to Mr. Cramp is due much of the present advanced development of the project and the certainty of its success, as well as the success of the Philadelphia Museums, with which he has been actively identified since the organization. He has for years been a manager of the Franklin Institute, a member of Port Wardens, and a director of the Union League.

He has always been notable for the zealous interest he takes in forwarding projects for increasing the commercial prominence of the city of Philadelphia and the country in general.

CORRESPONDENCE

ARIZONA.

(From Our Special Correspondent.)

CHLORIDE, ARIZ., June 24.

EDITOR JOURNAL:—A fine discovery of gold, silver and copper ore has been made on the Redemption mine belonging to Robt. J. Ferguson, Sons & Co. The location is two miles east of town on the west side of the Cerbat range, and is contiguous to the Tennessee, Schuylkill, Elkhart and other big paying mines of the camp. The discovery was made two weeks ago while doing development work in a drift where former assessments had been performed, and was a great surprise to the owners and others who visited the work. There is much black metal in the ore body, which is over three feet wide, and native copper is visible in much of it. With this two ounces of gold is the result of the latest assay which has improved from the beginning. The percentage of lead has not been tested, but it is thought that it carries not more than two per cent. Taking out, assorting and sacking ore is going on quite vigorously for a shipment, which will be made in a very few days. A part of the shipment will be consigned to the Arizona sampler at Kingman for treatment, and another lot will go on to Pueblo, Colorado. The discovery and extent of the ore body has attracted widespread attention.

As this is the dry season of the year, none of the concentrators at the big producing mines are running on much over half time, and, in consequence, there is a great deal of ore accumulating on the dumps. Much of this ore, however, will be shipped in its raw state if rains do not come soon.

The Merrimac mine has a vast amount of very rich ore on the dumps, and the big ore bodies in the lower workings are increasing the supply very fast.

The Tennessee mine continues in a large body of very rich ore, and some of the finest ore ever hoisted out of a mine in Mohave county is now being taken out. The shaft is down something over 300 feet, and one-third of this distance has been through a solid body of ore. Stoping back is soon to commence. In the body of ore are considerable quantities of both native and ruby silver, giving to the whole an average value of a little more than 100 ounces silver to the ton.

In Weaver district, which is situated twelve miles west of here, and which is exclusively gold, much activity and work is going on. On the Virginia mine there is a large quantity of free-milling gold ore on the dump, which is being sacked for a large shipment. Work in this district began in good earnest only about three months ago, but now besides the Virginia, the Ramrod has been developed and is producing almost as much. Three other claims in the district are also being developed with every indication that they will come in as big producing mines at no distant day.

Stockton Hill district is again producing some good ore, after a lapse of several years' abandonment. But this spring some of the owners of these old paying properties returned to do their regular annual assessments, but continued and did some development work in new places which brought to light some new and very rich bodies of ore, hence the present activity in the old camp.

The new railroad from near Kingman is now within a few miles of town, and will ar-

rive here in about two weeks, and the rates on ore shipments from here will be very materially reduced. The old wagon rates were from \$3.50 to \$4 per ton, and there are mine owners here who advance the idea that railroad transportation will amount to less than half these rates.

CALIFORNIA.

(From Our Special Correspondent.)

ISABELLA, June 21, 1899.

EDITOR JOURNAL:—Gold mining in a quiet way continues to look upward in this section. The mines heretofore worked will overreach the average this year in point of yield. But it is a new strike to which we are now looking for results unsurpassed by but few mines in this locality.

A month or two ago Vaugh and Crossmin determined sink to a depth of sixty feet on a cropping not well defined, but which had been prospected a little, and located on the ridge between Bodfish and Eshin creeks, about six miles south of this place. At a depth of about fifty-four feet they opened onto a five-foot ledge. One week ago they set four men to work deepening the shaft. Two men were employed packing the rock down the hill, and one four-horse team hauled it to the mill at this place. At the end of four days they cleaned up, having crushed twenty short tons and one thousand pounds. The yield was found to be slightly in excess of four hundred dollars, or twenty dollars per ton. A feature of the development was that the vein seemed to widen with depth, and at one point reached a width of eight feet. This mine is magnetic north from the famed Glenn Olive mine, and in the same zone, though Mr. Vaugh thinks it is not a continuation of that masterly lode, being some three miles away. This week there are six men engaged on the shaft, and it is expected by the end of next week to clean up a thousand dollars, after which tunneling and stoping will commence in earnest.

There is a growing attention being paid to the big contact veins of this section. Much prospecting is being done on the big contact running from Kernville to Havilah; but no one is yet ready to crush ore from the new developments.

The Stringer veins to the west are receiving the usual attention. Respectfully,

STEPHEN BARTON.

Northern California,

(From Our Special Correspondent.)

The aggregate output of Shasta, Trinity and Siskiyou counties for 1898 was \$5,290,642. Shasta county leads any other single county by nearly \$1,500,000, producing in 1898 \$3,510,728, and it is expected these figures will be increased by \$1,500,000 to \$2,000,000 this year.

The principal minerals of Shasta and adjoining counties are gold and copper, which form the most valuable combination of all substances produced in the State.

Opportunities for the investment of capital are offering that cannot be excelled anywhere. Both small and large amounts of capital can be invested with the same assurance of proportionately good returns.

It is now conceded that mining in California is upon a legitimate basis. The days of wild-cat schemes are past. By application of the same business principles, with the exercise and application of economy, the chances of success are greater than in any other branch of business, as mining is not affected

by droughts or floods, or the blighting grasp of trusts and monopolies. This is notably the case in Northern California, where mines can be developed without putting up stamp mills or other expensive plants, as the ores can be shipped to the Mountain Copper Company Smelter at a small cost. They pay 75 per cent of the gold value of all quartz ore from \$3 to \$15, and 77½ per cent of value from \$15 to \$25; then from \$25 up they charge \$3.50 per ton for smelting and give 90 per cent of the gold value. This makes the chances of losing any money very slight, indeed, and by the exercise of care and good judgment in selecting a property, together with small, judicious outlay in development, all chances of loss are turned into assurance of profit.

Evidences of the improvement in quantity and quality of ore is shown on every hand, and it is conceded by the most conservative of mining critics, that ledges in Northern California improve in size and value as depth is attained.

Many rich placer and river dredging claims are available, which, with small expenditure, will yield large returns. With the above facts before us, why go into the wilds of Alaska or the deserts of Lower California, when such good investments are to be had in a civilized and healthy country?

Money can be loaned on developed mines at good rates of interest, and with absolute security.

Redding, a city of 3,500 people, and rapidly growing, is the center of this extensive and valuable mining section. A. G. BOOGES.

UTAH.

(From Our Special Correspondent.)

SALT LAKE CITY, June 17, 1899.

EDITOR JOURNAL:—The mining stock market this week just about held its own, there seems to be no great desire to buy or sell. The speculative stocks continue to slump, while the investments shares are actively dealt in at fair prices.

Ajax was again much lower. Bullion-Beck paid its regular dividend on the 15th. The stock was strong. Centennial Eureka was steady. Chloride Point was active at above 80c. The mill is doing excellent work, and the shipment of high-grade ore will begin immediately.

Daly-West made steady gains. The company is mining about 80 tons per day, with a valuation of about \$50 per ton. Dexter was still on the down grade. Dalton & Lark did a fair amount of business. Daisy was lower, selling below 20c.

Eagle and Blue Bell was in the market with a shipment of high grade. Four Aces lost about all of its newly-acquired strength. Geyser-Marion was lower. Grand Central was in demand around \$8.25. Joe Bowers was featureless. Joe Bowers Extension has levied another assessment, one cent per share.

Lower Mammoth sold below 50c. Little Pittsburg was somewhat improved. La Reine was strong around \$1 mark. Important developments have taken place, main ledge encountered at 600-foot point in tunnel, about 8 feet wide showing pockets of ore running 100 ozs. silver, some lead and gold, which indicates a large body of ore near by. There is no question but what they have the main ledge from the Humbug mine and every chance of making as big a producer as any of the rich mines on this main ledge.

Mammoth weakened somewhat. Mercur

was rather freely offered; a dividend will be declared this month. Northern Light was lower; the mill is now in operation. Ontario was weak. Omaha was slightly improved.

Sunshine was lower. Sacramento was active—quotations were about the same as last week. Sunbeam was actively dealt in. Star Consolidated held close to the \$1 mark. Swansea was sold slightly under \$4. South Swansea was in great favor. Silver King recorded its first sale for some time, going at \$42.50.

Tetro has on another assessment, of one cent per share. Valeo was unchanged.

Very respectfully, P. J. CONWAY.

Miscellaneous Mining News.

ALASKA.

On May 4, on Douglas Island, Hon. D. O. Mills, of New York city, turned a screw and the largest stamp mill in the world was started running full blast—60 batteries of five stamps each, with a crushing capacity of four tons to each stamp every 25 hours. The building which contains these 300 Fraser & Chalmer's latest improved stamps is 325 feet in length and 80 feet wide, with a slanting roof 50 feet high at the eaves and 75 feet in the center. When a person enters the stamp mill it is impossible to hear even the loudest yelling, and no human voice can be heard in the din, as there are 50 tons of ore crushed to a pulp in every single hour that this monstrous mill runs, and with but two exceptions—Christmas and Fourth of July—they run the year round. Douglas Island can now boast of 880 stamps, which crush out 3,500 tons of ore every 24 hours. This will average \$4 a ton, which amounts to \$14,080 a day. One-third of this is settled in the concentrates which are taken to Tacoma to the smelter. This leaves \$9,386 a day as the output of the 880 stamps, and \$4,693 as the value of the gold sent daily in concentrates to the smelter. The Alaska Treadwell Company has two claims with 540 stamps, under Superintendent J. P. Corbus; the Alaska Mexican two claims and 120 stamps, and the United 3,700 feet of mining ground and 220 stamps, under Supt. A. M. Robeson.

ARIZONA.

The turquoise mines of Cochise county have been placed under option for sale to New York parties who have examined the property and declare the turquoise to be superior to any stone of its kind in the world, much superior to the best of the turquoise of the Orient. This will prove to be another Arizona industry.—*Copper Era*.

E. G. Eckis brought into Kingman a 78-pound bar of bullion from El Dorado canyon, Mohave county, that is worth about \$10 per ounce. It is the first product of his cyanide plant that is treating the tailings from the El Dorado mill. There are enough of these tailings to keep the plant steadily at work for several years.

CALIFORNIA.

AMADOR COUNTY.

The Blue Lakes ditch is opened from the head to the point at which the ditch divides, one part going to the Blue Lakes plnt and the other to the Mother Lode.

At the Defender mine at Pioneer the shaft

is now down 100 feet and is in a good ledge five feet thick. They are keeping their four-stamp mill running steadily.

The Mutual Mining Company has been incorporated, to open up the property recently bought between Sutter Creek and Amador.

By dint of hard drilling the Oneida shaft at Jackson has reached the 1900-foot mark, and very close to that point the ledge was encountered and passed through. At 1900 feet was where Superintendent Truscott expected to encounter it, judging from its place west of the shaft at the 1500-foot and 1700 foot levels. It came in however at 1892 feet, and the shaft has passed through it and will probably be pushed down to 1960 feet before stations are cut in the ledge at the 1900-foot level. The ledge was found to be twelve feet tick at the south side of the shaft and ten feet at the north end, and contains enough valuable mineral to make it good milling ore. Mr. Truscott does not know just what the Oneida Company will do, as Captain Mein has not been able to visit the property since his return to the States, but it is reasonable to conclude that the old shaft will be reopened, a mill constructed and mining and milling pushed as rapidly as possible.—*Amador Ledger*.

CALAVERAS COUNTY.

Preparations are now being made to resume operations at the Esparanza mine near Mokelumne Hill, on a larger scale than ever before. The stamp capacity is to be increased to eighty stamps, a new hoist to be erected and the shaft is to be sunk an additional 500 feet. As soon as the new machinery can be put in place there will be nearly 100 men at work at the mine.

The directors of the Veritas Mining Company held a meeting in San Andreas last week. Sinking will begin on the shaft as soon as the upper levels have been put in condition, which will be in the course of two or three weeks. Meantime the drifts are being extended, stoping is going on, and the 200-foot cross cut is being opened. The mill is hammer away on ore that is quite satisfactory. The machinery has been renovated, having been taken out and cleaned, both as to hoist and mill. A new Wifley concentrator has been put in and three new water tanks, two of 10,000-gallon and one of 5,000 gallon capacity, have been erected.

EL DORADO COUNTY.

A large lot of machinery has been shipped to the Globe Mining Company, at Nashville, by way of Plymouth. The shaft is down 750 feet and they will sink 750 feet farther before cross-cutting. They are now placing in an air compressor of eighty horse-power.

The Chicago Mining Company has incorporated with capital stock of \$25,000 in 10-cent shares. J. E. Shettle and E. M. Shettle of Nashville and L. M. Byers, F. A. Sakuth and W. A. Byers of Salt Lake City are the incorporators. J. E. Shettle is president and W. A. Byer is secretary and treasurer. They will begin work on the Rip Van Winkle at Nashville which they bonded from Dan C. Wickham. There are eight claims in the group.

Randsburg Notes.

KERN COUNTY.

The Kinyons are taking out some exceptionally rich ore and will have a milling of it soon. They now have over 200 sacks of that

rich stuff. The mill is kept running for the present on ore from the dump, or former refuse, which is going about \$10 per ton.

The Annex mine is showing up in good shape. This mine is owned by S. J. Montgomery and Ed. Maginnis. A milling was made recently at the Red Dog mill which turned out well. Three men are at work and the main shaft is down 130 feet.

The owners of the Minnehaha mine are having about 25 tons of ore crushed at the Black Hawk mill.

The Wedge is having another run made at the Red Dog.

SAN BERNARDINO COUNTY.

Geo. A. Zwanzig of Daggett has a good thing in his Paradise Springs mine. A test made at Barstow on this ore showed \$46 per ton. There is about 65 tons of it on the dump, which will cost about \$5.55 to deliver it to Daggett \$0.80 freight from Daggett to mill at Barstow and \$1.25 treatment charges per ton gives a net return of \$38.40 per ton or about \$768.00 per carload. Mr. Zwanzig intends putting in a Cyanide plant on the ground to work his ores. Besides the mines he owns an extensive water right.

A meeting of miners was held in Daggett last week for the purpose of forming a mining district which will govern mining and the location of claims within said district. Reports of the meeting have not been received as yet.

TUOLUMNE COUNTY.

At the Densmore work for the present is confined to drilling and stoping in the tunnel levels. The new new hoist has been completed and sinking in the shaft will probably be resumed the coming week.

In the O'Hara claim a \$3000 pocket was taken out last week. The claim is operated under a lease by A. E. and Charles Elsbree and James O'Hara, Jr., but is owned by James O'Hara, Sr. It has paid handsomely in the past and is evidently trying to keep up its golden record.

The old Sugarman claim, just north of Sonora, one of the greatest pocket mines the west has ever produced, has been giving up bunches of gold at irregular intervals for several months past. Last week the clean-up was \$2000, with more of the pocket still in sight. The fortunate diggers this time are Charley Smith and Jack Brady, both practical pocket miners of long experience, who pay a royalty to J. H. Neal, of Sonora, the owner of the Sugarman.

President W. H. McClintock, Secretary Chas R. Thurnburn, W. R. Gillis, Sidney Sprout, S. A. Fisher, Fred Sutton, H. E. Vail and N. F. Pickle of the executive committee of the Miners Association of Tuolumne county were in session all Wednesday afternoon, when a constitution and by-laws of the organization were formulated and accepted. With but a few immaterial changes they are the same as those governing the State Association.—*Sonora Union-Democrat*.

COLORADO.

A contract was let in Denver for sixty 1,500-pound stamps, with all necessary appliances, to be installed on the new addition to the large Smuggler-Union mill, near Telluride. The enlargement of the mill means an

increased ore output from the Smuggler-Union group, which recently passed under the control of a Boston Colorado company, supposed to be closely allied with the famous Calumet and Hecla Copper Co.

A discovery of great importance was made in an uprise from the eighth level which is about 800 feet from the surface and which is nearly at the bottom of the mine. In going up from this level a very strong and clearly defined lode has been followed. It is in the granite, and the ore follows a small phonolite dyke.

It the top of the uprise, which is now about 75 feet above the floor of the eighth level, the ore has widened out so as to exceed the size of the uprise workings. Up to this point the ore body was five feet wide and had the splendid average value of from three to six ounces in gold to the ton. This information is authentic and can be absolutely relied upon.

Another new ore body has been opened up in the Dante mine. The important discovery was made last week, and consists of two feet of ore which the manager at the mine states makes a splendid showing.—*Mining Investor.*

IDAHO.

The Seven Devils district of Idaho, owing to the high price in copper and the increased attractiveness of all copper properties, is now the scene of the greatest activity.

W. A. Clark, of Montana, has already got a foothold there. Two of his agents have just bonded the Blue Bell and Apex for \$50,000, and three other properties, the Dollie Gray, Gray Eagle and Centipede, for \$51,000. These bonds were taken for one year.

The fact that two such men as Patrick Clark and W. A. Clark are to operate there will attract renewed attention to the Seven Devils district. Cuprum is the name of the new mining town of the Seven Devils and it promises to be a lively place. The Vaughn Bay is a claim on which a great strike was recently made. A tunnel has been run in 120 feet, and a cross-cut 80 feet, all in ore. It is really a marvelous showing.

Barry A. Hillard is making slow progress in the purchase of the placer territory of Prichard Creek. Something over one-half of the ground lying between the Daddy village, half a mile west of Eagle, comprising about five miles of placer territory. Those who have sold their claims feel somewhat unfriendly to those claim owners who are holding back and others who have suddenly raised their prices which no sane man would consider for a moment. It is hinted that unless a purchase can be made during the present month the enterprise will be given up, and the money paid out will be considered as lost. The big steel pipe line has also been placed under option by Mr. Hillard, and if the requisite amount of ground can be obtained it will be repaired as speedily as possible.

Ground-sluicing on the Granite is completed. Where the soil was washed off, about 800 feet east of the old works, the ledge showed up 18 feet wide, with ore from wall to wall. It is different ore from that in the old workings, being plentifully sprinkled with galena. Assays of the surface showed 30 per cent. lead, \$13.27 gold and 2½ ounces silver, making the ore worth about \$40 per ton. They ran 1,500 pounds of it through

the mill where it concentrates well, but the concentrates were not weighed, so what part of the lead was saved is unknown. A shaft is to be started on the new discovery and enough men kept at work in the old works to furnish what ore the mill can handle—20 tons per day.—*Wallace Press.*

MICHIGAN.

The Resolute.

About fifteen men are now at work on the Resolute property in Keweenaw county, which adjoins the Pawnee. The company has \$30,000 capital, all paid in cash into the treasury by Escanaba and Calumet gentlemen, and the entire capital will be used for exploratory purposes. The first work to be done is the unwatering of the 350-foot shaft sunk on the property years ago and in which it is said, by men who worked there in 1866, that there is a vein four feet wide. The new company also hopes to be able to locate the Mohawk lode on the property. If developments warrant, a company will then be organized with adequate capital to open the mine on a modern scale. Capt. Robert Vivian is in charge of the work being done.—*Hancock Copper Journal.*

MINNESOTA.

The annual meetings of the Minnesota Iron and the Federal Steel companies were held in Duluth the morning of June 12th. The party of stockholders, who had been visiting the mines and the railroad, arrived back in Duluth early in the day. A. R. Flower succeeds his brother, the late R. P. Flower, on the board of directors of the mining company. Board of directors of the company now stands as follows:

G. S. Brewster, H. H. Porter, A. R. Flower, H. M. Flagler, D. O. Mills and Henry Siebert, of New York; E. J. Buffington, M. J. Carpenter, C. P. Coffin, C. W. Hulliard, of Chicago; E. W. Winter, of St. Paul; D. A. Bacon, J. L. Greatsinger, of Duluth.

The election of officers was as follows: D. H. Bacon of Duluth, president; Henry Siebert of New York, vice president; C. P. Coffin of Chicago, secretary and treasurer; Thos. Murray, assistant secretary and treasurer.

These gentlemen compose the officers and directors of the Duluth and Iron Range Railroad Co.

MONTANA.

A shipment of smelting ore was recently made from a claim near the Dandy. It ran high in gold.

Jesse Garver, the discoverer of the B. & G. mine, in the Warm Springs district, is in Helena, he and partner, William Wallace, having just extracted and shipped a car of ore from the Fleming lead, in that district, which netted \$81 per ton in gold, silver and lead. In accordance with his annual spring custom, Mr. Garver has made a new discovery, the ore being a lead carbonate carrying two ounces of gold to the ton.

Rapid progress is being made in sinking the new shaft on the property of the Bonanza Chief Mining Company, eight miles west of Helena, a depth of 60 feet having been reached.

Concentrating tables have been put in the

stamp mill on the Jerusha mine, on Lost Horse gulch, northwest of Marysville, and the mill is being run to its full capacity on the medium grade milling and concentrating ores. High-grade ores are also extracted and shipped to smelters.—*Helena Independent.*

NEVADA.

Silver Peak.

Sam Case has a crushing out and is taking out more daily.

Bell & Court are doing development work on their new strike in the San Antone mountains.

There is very little doing at Alida valley. The boys are taking out some high grade silver ore.

MacNamara and Burger have a streak of rich gold ore about eight inches wide in their mine, and will probably take out a crushing shortly.

Henry Jaegles has been shipping to San Francisco and finds it has paid him to do so. He has a large amount in the Homestake to take out, and will probably work it here in the new mill.

The leaching works are running tailings through the second time and ship a bar about every three weeks. There were about 10,000 or 12,000 tons altogether, and the first time they were leached they paid a fortune to the owner, and they are good enough now to pay for working.

Leidy & McAfee's new mill is about ready to run and will be a godsend to that country. The miners can safely estimate on getting a fair deal now. They have about 100 tons of high-grade ore to start on and have a large amount of second-grade ore in the Great Gulch mine.

NEW MEXICO.

The Midnight mine, located between Red river and La Belle, N. M., which has over 900 feet of workings, but which was shut down about a year ago, owing to bickerings among the owners, is to be opened up. The property is owned by Mark Hanna and other capitalists of Cleveland, O.

The biggest mining deal ever consummated in New Mexico was made by the Hearst estate in the sale of the celebrated Santa Rita copper mines. The price, all told, figures \$1,400,000.—*New Mexican Miner.*

OREGON.

At the Bonanza mine ground is being broken for the mill to hold 100 stamps. The present 20-stamp mill will have 20 more stamps added, and, when the new mill building is completed, the 40 stamps will be put to work alongside of 60 more.

The Golconda's \$100,000 mill will begin operating steadily with the bromine-chlorine process in a few days, and, it is reliably stated, the new process has been found on trial to be all that is expected of it.

The Ibex mine, which not long ago was sold to a Saginaw, Michigan, capitalist, is to have a first-class mill erected for operation on its paying ore.

The Mammoth Mining Company has con-

tracted for new road building and in all directions new roads are to be built and old ones repaired in preparation for great activity in the needful transportation of equipments and supplies to new and old gold properties.

Messrs. Reed Bros. and Bartlett, of Colorado Springs purchased the placer claims of C. C. Logan, situated on Poker Flat, near Auburn, paying therefor \$1,500.—*Baker City Democrat.*

SOUTH DAKOTA.

The Uncle Sam mine, on Elk Creek, South Dakota, is nearly drained of water and sinking of a new shaft will commence soon. There is an old incline in the mine through which the ore has been hoisted, and it is stated that a shaft and drift will be made to straighten this. This mine was at one time very rich in free-milling ore. It has now been purchased by a Chicago company, organized by Arch-Bishop Ware, of Deadwood.

A large force of men is at work at the St. Elmo mine, at Oreville, east of Hill City, South Dakota. The 10-stamp mill is running steadily and a large vein of free-milling ore has been opened up. The ore will run about \$10 a ton gold. The Sunnyside mine is still being lowered in the main shaft.—*Black Hills Mining Record.*

UTAH.

The Ajax Company's property at Mammoth is maintaining its past record, and conditions surrounding the proposition seem generally favorable. Grand Central properties near Mammoth are making an admirable showing. The new plant thus installed is modern in every respect, and will greatly increase the mine capacity. Nothing new is coming in from the Lower Mammoth property at Mammoth. The treasury of the Mammoth Company is in good condition, but dividends may not be resumed before August.

The Bullion-Beck and Champion Co. of Eureka paid its regular dividend of \$10,000 on the 15th of June. The long-expected ore shipment from the Eagle & Blue Bell of Eureka was received in Salt Lake on June 14th, the ore averaging four ounces in gold. At the properties work is progressing steadily and the new ore body is being thoroughly exploited. Some fears for its permanency are still entertained. The Tetro property at Eureka is looking very well, but an assessment of one cent per share has been levied.

Chloride Point Mining and Milling Co.'s plant at Mercur is running steadily and doing good work. The Daisy Co. sent in a shipment of cyanides to Salt Lake City from its Mercur property, valued at about \$5,800. The Geyser-Marion Company also sent in a shipment of cyanides from its Mercur properties. Something like 30 feet of ore has been uncovered in the Little Pittsburg mines at Mercur. Mercur was a heavy dealer at \$7.50, one large holder deciding to clean out at that figure. The uncertainty as to the amount of the anticipated dividend and its date of payment made the market on the stock a very unsatisfactory one, although support was good at the figure named. It was predicted that a dividend for June would be declared, the amount to be 25 cents per share, payable quarterly hereafter. Good reports were received from the properties.

Some heavy buying orders were in at the Salt Lake Exchange for Daly-West of Park

City, and all loose stock was displaced. The buyers are very conservative people, and their lead is being followed by the general public. As a result, much better quotations are being made, and still higher prices are expected as the day for the commencement of dividends approaches. The mines are looking extremely well, and are now making an output of 85 tons of ore per day, which will average about \$50 per ton. The June dividend of \$50,000 for Silver King of Park City has been paid. The property is in splendid shape.

WASHINGTON.

The Cleopatra, near Skykomish, Wash., has a 5-inch strata of antimonial silver ore in their tunnel at a depth of over 300 feet that samples 2,000 ounces in silver. They are doing extensive work. Their ore shipments are made from Skykomish.

Republic tunnel No. 4 was driven in 435 feet during the month of May, which is an average of over 14 feet per day. The total length of the tunnel will be about 2340 feet, which will give 600 feet depth. It is expected to reach the ledge by October next. If the wonderful values found above hold out in the new tunnel, it will make the Republic one of the world's greatest gold mines, and give Republic another boom which will send it ahead at a great rate.—*Miner and Electrician.*

FOREIGN MINING NEWS

BRITISH COLUMBIA.

The Enterprise, Ten Mile, B. C., has over 200 tons in the bins at the wharf and 800 tons at the mine. The new company will have this hauled to the wharf, and it is expected will commence shipping at an early date.

Austin Corbin and associates have bonded Paddy McHugh's properties on Twelve Mile, and will commence work as soon as the snow is off.

A good find was made last week by Harry Mathews, three miles from Duncan City, on Howser Lake. The formation is lime and it is generally believed that it is a continuation of the rich lime formation on which the Bannockburn, Wagner, Gertrude and other prominent claims are located. This is the most important discovery on the peninsula, and is looked upon with considerable enthusiasm by local mining men. Mathews has named his new claim the Duncan, and states that the ore found is \$30 galena. It is expected that there will be a rush of prospectors to that locality together with those already on the ground.—*Kootenian.*

MEXICO.

The Purisima mine, State of Nueva Leon, is turning out ore which assays some fifteen ounces of gold to the ton.

It is credibly reported that on June 12 a Mexican found near Suquai Grande, Hermosillo, State of Sonora, Mexico, a gold ledge about two feet wide, very rich on the cappings. Thirty-five ounces of gold was pounded out of the rock in a hand mortar within a very few hours.

Ore shipments from La Bufa mine, in the southwestern portion of the State of Sonora,

have been discontinued until after the rainy season on account of lack of feed and water on the road. About 300 tons of high-grade ore have accumulated.

Word from the vicinity of La Bufa—beyond La Dura—conveys the intelligence that Mr. Jas. H. Brent of Torres has made a very rich and extensive strike in his Pilado mine. He has developed a large body of ore which is rich in lead and runs 400 ounces per ton in silver.

Messrs. J. W. Bryan of Washington, D. C., Marshall P. Wright of Kansas City, and their associates have developed in their Cibuchicari mine, near the old Llano Mission church, east of Matape, in the Ures district, State of Sonora, a great mineral deposit of wonderful richness. The entire mountain is said to have proved to be ore running from \$40 to \$250 per ton in gold.—*The Oasis.*

GENERAL NEWS.

California Mineral Association.

The *San Francisco Call*, under date of June 17th, prints the following remarks regarding the Southern California Branch of the California Miners' Association, which we and all mining people endorse:

"The things of most importance concerning the rapid growth and progress of the California Miners' Association are the Southern California branch of the association, organized a few days ago at Los Angeles, with Stephen M. White as president, and the mistaken hostility to the organization which has for some weeks been expressed repeatedly by news and technical journals and a few mining men of that region.

This new organization was effected about six weeks ago at Los Angeles, at an open meeting, attended by Secretary E. H. Benjamin, Attorney General Ford, Senator Davis, A. H. Ricketts, Charles G. Yale and others of the California Miners' Association. The new society, supposed to represent the interests of Southern California in the association, has been supported by a number of the leading mining men in that part of the state, and has already acquired a considerable membership. In spite of the hostile arguments from some sources that an independent organization would be much better. This hostility on the part of some men and influences interested in the mining prosperity of Southern California is certainly a mistaken one that will not help the mining industry south of Tehachapi, which has never before specially figured in the work of this powerful state organization.

Those who have objected with many words to the affiliation with the California Miners' Association say in effect, first, that the fields and their interests are naturally separate; second, that the California Miners' Association is controlled by San Francisco business men, who use the organization to divert the mining trade to and control it from San Francisco; third, that Central and Northern California put little men or money into Southern California mines, and that the importance of the industry south of Tehachapi is not recognized up here. It has been said that "the bay people do not give fair and adequate consideration to the mining interests of Southern California; that bay capital cannot be interested in Southern California mines; that Los Angeles is interested in building up a mining trade that would be best fostered by an independent organization; that Southern California mining opportunities can be better advertised by a separate organization; that

the California Miners' Association is chiefly seeking 75 per cent of the membership dues, which have been fixed at \$1 per year for individuals, etc."

The urging of these things in the columns of news and technical journals and from meeting platforms has hindered the growth of what promised to be a strong and effective auxiliary association. It is another exhibition of the feeling of independence of the rest of the state that bobs up now and then down there.

To say that the mining interests of California are split into two parts by a range of mountains is to take a narrow and erroneous view of the California Miners' Association. The state association is made up of fourteen county organizations, and the association has never since its organization, seven years ago, either in annual convention or through its executive or other committees, dealt with matters of sectional interest, except in the great matter of the rehabilitation of hydraulic mining. This question gave the association its birth, and the Caminetti law gave evidence of its power and effectiveness, but since then this question has been an incidental one.

This association gave birth to the pending demand for a cabinet department representing the mining industry, and it still hammers away at the plan, helping to give it needed boom and prestige. Southern California is as much interested in this as any other part of the state or country, as it is in the mineral lands bill, to which the association gave birth and the bright prospects of which are to be credited largely to the insistent work of the association, largely done through A. H. Rickelets. The revision of the Federal mining law is another field of its labor, not peculiar to the interests of any section. A number of such matters of equal interest to miners of Utah, Arizona, Southern and Northern California have been taken up by the association, and await the added support of the Southern California mining interests.

In matters of state legislation the association has been an effective force and will continue to be one. The Legislature has in the main acceded to its recommendations as to mining legislation, and its representatives have always been a definite and effective force before legislative committees and with legislators. The liberal support of the State Mining Bureau has been largely due to its influence. The appropriation of \$250,000, which it gained from the Legislature as well as from Congress, is one evidence of its political force. Another among such evidences is the tacit understanding with the Governor, that after raising by \$10,000 the appropriation for a California exhibit at the Paris Exposition, \$25,000 should be devoted to the mining industry of the state. It has been along such broad lines that the association has worked so far, and it is along such lines of general importance that it has gained the prestige and esteem it holds in the halls of both national and state legislation. The future effectiveness of the association in Washington and Sacramento would be further increased by the co-operation of the leading influences concerned in the mining industry of the southern part of the state. If in the future two miners' associations should exist, the two would hardly agree on the same specific propositions, and the divided counsels might easily confuse and defeat measures of importance to the whole mining industry of the state. A larger representation of the industry acting as a unit would add much to the power and scope of

the association's efforts. What has been accomplished so far, including an effective example of what may be done by an organization of the mining industry on broad lines has been done with little aid from Southern California. The California Miners' Association is not a chamber of mines. It concerns itself with no mining properties and it does not try to influence the mining trade. Its purposes are broader, and it confines itself to those broader purposes of general legislation and the general prosperity of the industry. "Uncle Jake" Neff, who is and has been since its organization its president, confines its efforts to fields in which Southern California is as much interested as any part of the state.

Much San Francisco money is invested in Southern California mining properties, but it is to the East and to Europe that the whole state largely turns for mining capital, and this is especially true of Southern California. The California Miners' Association has not given Southern California especial attention, for the good reason that Southern California was not represented in it. Its wants would have more effective attention through one strong state organization than through a small independent one. The American Institute of Mining Engineers will meet here in September as the guests of the California Miners' Association, and will give another illustration of the value of affiliation. The association will issue a large and handsome exposition of the mineral resources of the state, in which Southern California will be fairly represented, and with which such an affiliated association might concern itself. In the matter of the Paris mineral exhibit, a unity of policy will add to the success of the display. As a new mining region Southern California will have land, water, road, legal and departmental matters which would be handled with more success and benefit by a strong and influential organization, representing the whole state than by one representing a small region.

Active affiliation with the state association would tend to cure neglect, if such exists, and to turn attention southward, and make the splendid undeveloped resources of Southern California better known. The California Miners' Association seeks moral strength rather than financial co-operation, and from every point of view, the interests of the mining industry in Southern California seem open to better service from a great than from a local organization.

ANTHRACITE COAL IN PERU.

(BY WILLIAM GRIFFITH, C. E., SCRANTON, PA.)

[Begin in our issue of May 15th, 1899.]

THE SOUTHERN FIELD.

As stated before, this same series of coal-bearing rocks probably extend further to the southeast, as has been reported. We know, however, that coal dirt or blossom is brought from what was represented to us as a large coal bed located beyond the limits of our search to the silver mining town of Quirivilca, and there made into balls by mixing with clay for domestic use. Samples of coal were also shown to us from the northwestward extension of this same field, taken from another branch of the Chicama River, giving evidence of the extension to the northwestward of this coal field, far beyond the territory visited. As to the uniformity and continuity of these coal seams we will say we consider the measures here to be much more

disturbed through volcanic action than in the northern field. Nevertheless, we believe that the evidences of continuity are sufficient to warrant the conclusion that an immense body of coal exists in this vicinity, which can be economically mined, and much of it above water level, even within the territory described; while the same measures unquestionably extend in both directions far beyond these limits. Samples of coal were taken from the openings mentioned, an average sample of which gave the Analysis, No. 2, following, also by Mr. McCrae:

ANALYSIS NO. 2.

Water.....	1'596
Volatile matter.....	3'030
Fixed carbon.....	90'906
Sulphur.....	652
Ash.....	3'816
	100'000
Specific gravity.....	1'67

From this analysis we should judge that the coals in this region are of unusual purity and excellent quality. For sake of comparison we give here an average analysis of Pennsylvania anthracite:

NO. 3—PENNSYLVANIA ANTHRACITE, AVERAGE OF 31 ANALYSES.

Water.....	3'277
Volatile matter.....	4'317
Fixed carbon.....	83'294
Sulphur.....	600
Ash.....	8'514
	100'000
Specific gravity.....	1'59

It is impossible to make any reliable estimate as to the depth to which these coal seams extend. As stated above, they dip into the ground at an angle of about 70° and extend along the strike from the northeast to southwest from 15 to 30 miles or more. Owing to this dip, and the fact that the soft measures have been washed away from the outcrops, it is much easier to open into the coal and follow the outcroppings than in the northern field. And while the coal openings are more numerous, and much more coal actually visible to the eye in the southern field, it does not necessarily follow that there is more minable coal here, because owing to the different mode of disposition of the coal, the outcrops in the northern district are more or less covered with debris and vegetation, so that they are not visible unless exploration is especially made for the purpose of uncovering them. And the beds are so disposed that they may be more cheaply mined.

We made a collection of the fossil plants which are to be found in the slates accompanying the coal beds, which have been submitted to experts of the Smithsonian Institute at Washington and elsewhere, and they have been able to state, perhaps definitely, as to the geological horizon of the Peruvian coals. From the results of their investigations there would seem to be no doubt that these measures are of more recent age than the anthracite coals of the carboniferous measures of Pennsylvania or the Triassic coals of Richmond, Va., and are probably of Jurassic age and somewhat older than the anthracite and bituminous coals of the cretaceous formation in Colorado. Their position being thus midway, as it were, between formations containing economical coal beds of well known extent and continuity, would seem to be favorable for an extensive deposit of coal in the region under consideration. In Colo-

rado the anthracite coals are known to be more or less local in extent; that is to say, the bituminous seams are found overlying or underlying the seams of anthracite, in the same formation, while the same bed of coal may be anthracite in one place and bituminous in another. This is doubtless caused by the fact that the heat required to change the bituminous coal to anthracite, which was probably derived from the existence of eruptive rock near the coal seam, was more or less local in its effects, and apparently more intense in some places than in others; and the bituminous coal which in one place was undisturbed, in another part of the coal measures was converted into anthracite. We think we are prepared to say that this condition of affairs does not exist in the limits of this territory.

Throughout our travels we have noticed the unmistakable evidence of an intense heating of the rock formation in all portions of the Andes Mountains. The sandstones containing the coal, wherever we have noted their existence, have been unmistakably heated to an extreme degree, and there were absolutely no evidences of the existence of bituminous coal anywhere within these measures, so far as we have been able to ascertain.

We regard the lignitic coal of Yanacancha and elsewhere as a deposit of a more recent age, and while we understand that coal of various kinds exists in other portions of the same region, not examined by us, we think it extremely doubtful that in any of these places will be found bituminous coal in the rocks of the same age that contain anthracite. We are, therefore, of the opinion that the anthracite coals of these fields will be found uniform in quality throughout the whole extent of the measures in which they exist.

HUAMACHUCO BASIN.

Our travels were continued to the ancient town of Huamachuco, on the eastern slope of the Andes. This town is located in the bottom of a wide, deep valley, evidently composed of the soft measures underlying the coal-bearing rocks. Capping the mountain on either side of this valley, the measures have the same appearance at a distance as those which covered the hills in the northern field described. Abundant rumors came to our attention of the existence of coal seams in the mountains adjacent to Huamachuco. No attempt was made to examine them, as they were evidently more or less inaccessible, and our time was limited. However, it is probable that economical coal beds exist here on the eastern side of the continental divide. The citizens of Huamachuco use the coal blossom from the anthracite seams of the valley for domestic purposes by mixing with clay, as before described. It is questionable, however, whether the beds near the town from which this blossom is secured are of economical thickness. It is highly probable that if proper time was given to exploration in this northern portion of Peru, other coal areas would be found within the region covered by this paper, and which are not known at present. From what has gone before, however, it would seem conclusive that there exists in the Andes Mountains of northern Peru a vast wealth of anthracite coal awaiting development for the supply of the coal market of the western coast of South America or along the Amazon River system.

Read the article on Venezuela's mineral and other resources. Begun in our issue of June 15th and completed in this.

THE MINERAL AND OTHER RESOURCES OF VENEZUELA.

BY SEÑOR FRANCISCO J. YAMES.

(Continued from our issue of June 15th.)

Next in importance come the copper mines of Aroa, located in the section of Yaracuy in the State of Lara, on the banks of the river Aroa. These mines were discovered in 1605, but during the whole period of Spanish rule over the country their yield was almost insignificant. They are worked at present by an English company. The ore is found in a kind of slaty limestone and is principally chalcopyrite, called yellow ore, containing from nine to twelve per cent of metallic copper. This ore undergoes several transformations, being changed into red oxide and carbonate of copper. Nearly all the output is shipped to Swansea, England. From 1878 to 1891 there were shipped 329,213 tons of ore, averaging over 11 per cent of copper, and 53,053 tons of regulus, averaging over 27 per cent. These quantities represent in all 51,759 tons of metal, which at the average price of fifty-four pounds per ton make a total of about \$14,000,000. There are in all fourteen copper mines in the country.

The best known silver mines in the country are the Tope mines, which were worked by the Spaniards in the eighteenth century. Besides this there are eight more silver mines in the country.

There are also ten iron mines in the Republic, the best known being the Imataca mine, the property of an American citizen, situated near the Orinoco river, the third largest river in the new world, and the main waterway of Venezuela. By analysis it has been found that the ore contains from sixty-seven to seventy per cent of pure iron, and it is said to produce a high grade of steel and that the Imataca iron is only equalled by the best Swedish product.

Mines of coal, petroleum and asphalt are also found in Venezuela, there being known to exist at the present time twenty-four coal mines, five of petroleum and sixty-four of asphalt. Among the first the Naricual mines must be mentioned, as well as the Cumanbo mines, the former being situated in the State of Bermudez, and the latter in the State of Falcon. Both seem to yield very fine coal, the Naricual coal being particularly adapted to the manufacture of coke, while the Cumanbo coal, according to the analysis, is a fine quality of lignite.

Petroleum is found in the States of Los Andes, Bermudez, Zamora and Zulia, and some of the deposits are not only natural flowing wells, but spout up with steady force.

Among the petroleum mines of the country those called "Petrolia," in the State of Los Andes are considered among the best, the development of which will facilitate the supply of this product in certain States in Venezuela, as well as in the neighboring Republic of Colombia.

Asphalt is found in the States of Los Andes, Bolivar, Falcon and Zulia.

Besides the mines already mentioned, I may add that there are also in Venezuela seven known mines of sulphur, six of rock crystal, five of marble, the best known of which is the Ganango mine in the State of Carabobo, which produces a very fine quality of marble; seven lead mines and also mines where thirty-one different minerals are to be found.

Among the mines the Araya salt mines belonging to the Government deserve special mention.

The Venezuelan Government, desirous of

the development of the mining interests of the country, has enacted important and liberal mining laws and has established a school of mines at Guaciapiti, an important place in the auriferous region of Guiana, for the education of mining engineers, where both a theoretical and practical education can be had.

I have now given you a brief sketch of the mining wealth of Venezuela.

As I remarked previously, I am not an expert in mining and have come here only representing a country which has special reasons to feel grateful and friendly to the United States for the support given her in a matter of vital interest and of territorial importance to Venezuela.

My mission is to show you that we wish to follow in the footsteps of those who are more advanced than ourselves in the development of industrial progress, and that we have in our country untold wealth that only needs capital and labor in order to yield its richest harvest and to report to my government the result attained by the deliberations of this Congress with a view to foster our own mining industry. Foreigners are well received and welcomed in my country, where the laws are liberal and the people hospitable. Therefore, any one wishing to help in the development of our natural resources is welcomed, not as a foreigner, but as a friend.

Venezuela is one of the members of the International Union of American Republics, an institution established by the recommendation of the Pan-American Congress, which you all undoubtedly remember. The object of this organization over whose executive committee the Honorable Secretary of State of the United States presides, is to establish closer commercial relations among the nations of this continent, by furnishing data in regard to their resources, laws and so forth. The bureau of American Republics in your capital city, Washington, D. C., is the representative of the Union, where upon application you may have all the information you desire in reference to the mining laws of Venezuela, its agricultural wealth, and in short any data relating to the Republic.

The Modern Metallurgy of Copper.

The metallurgy of copper has in the past few years been greatly advanced and simplified. The most important and far-reaching modifications have been in the extraordinary extension of the Bessemer principle in copper reduction, and of the electrolytic process in copper refining. By the Bessemer process the impure copper or matte produced by a single smelting is run in the liquid state into a Bessemer converter, air is forced through the liquid, the impurities oxidized and removed, and bar or pig copper obtained by a single operation. At least one roasting and one smelting, and often more, are thus saved, together with all the fuel and labor involved in these processes. The Bessemer method is now extensively followed at the great mines of Montana and Arizona, also in Colorado. It is safe to say that the electrolytic process of refining copper is now applied to between one-half and one-third of all the copper produced in the United States. The electrolytic process separates gold and silver that may be present in the copper and deposits the copper in a state of great purity. To accomplish this the unrefined copper from the smelter or Bessemer converter is cast into great plates or anodes, weighing three hundred pounds or more; these anodes are suspended in tanks containing a solution of copper sulphate, op-

posite to cathodes, which are also copper plates but very thin, and consisting of pure metal. The passage of the electric current in the proper direction gradually transfers the copper from the anode plate to the cathode plate, while all the impurities are left behind. The gold and silver which are present in the unrefined copper fall, during the process, to the bottom of the tanks, and are afterward collected and separated from each other. Some idea of the importance of this method of copper refining is given by the following facts relating to the Anaconda Copper Mining Company's Montana refinery:

This refinery, which is one of many in this country, contains twelve hundred electrolytic tanks, each tank requiring about four tons of copper as a charge. The electric energy employed in the deposition is the equivalent of twenty-three hundred horse power. This single plant has turned out over one hundred tons of refined copper daily during the past few years. There is separated from this daily output of copper about seven hundred pounds of silver and fifty ounces of gold. This refinery treats only about one-half of the company's crude copper, the remainder being treated at Eastern works.

The Van der Naillen School of Engineering at 933 Market street, San Francisco, Calif., has completed its thirty-fifth year and has a large list of graduates. Following are those who have completed the work in the various departments:

Mining—A. R. Gurrey, Shasta; E. Mateson; Nevada; F. J. Kellett, St. Helena; H. G. Moss, Orange; J. L. Stubbs, Lower Lake; J. F. Williamson, Seattle; I. L. Ryder, San Jose; R. P. Turney, Campbell; C. P. Christensen, Randsburg; O. R. Lawson, Gold Hill, Nev.

Surveying—H. Koenig, Oakland; Geo. B. Kearney, Santa Barbara; Paul E. Lepoids, Los Angeles; E. H. Bushong, San Francisco; E. W. Nolan, Callahaus, Cal.; G. Winter, Yolo, Cal.; F. W. Saunders, Empire City, Or.; George Colbert, San Francisco; E. B. Olney, Chico; C. S. Winter, Berkeley; J. R. Myers, Honolulu; C. A. Call, Fort Bragg; Carl G. Bell, Colfax.

Assaying—W. S. Lauritzen, San Jose; H. T. Sedgley, Siskiyou; A. M. Thompson, San Francisco; A. C. Turley, Virginia City; M. Jones, Paris, Ill.; G. M. Rolph, Grass Valley; J. M. Landis, Callahaus, Cal.; R. C. Hicks, Cornig, Cal.; W. H. Irwin, Oakland; E. L. Howard, San Francisco; W. J. Pascoe, Mexico; A. Campbell, S. T. Parks, San Francisco; George J. Probasco, Baker City, Or.; G. H. Call, Fott Bragg; H. F. Lyon, San Francisco; C. B. Volkert, Dyea, Alaska; H. G. Siskron, Lower California; E. M. McNaught, San Francisco.

Electrical Department—D. M. McVean, A. Gilmartin, C. E. Severeen, G. H. Wadman, San Francisco; Wm. Bulson, Stockton; R. E. McDaniels, Creswell, Or.; E. H. Lowe, Knights Ferry; Charles R. Forge, J. G. Finley, San Francisco; E. M. Cleary, Oakland; W. J. Shea, San Francisco; R. H. Cunningham, Arizona; A. McLukie, New Zealand; C. P. Hunt, San Francisco; H. W. Riblet, Sonoma; H. C. Haselbach, Biggs, Cal.; G. B. Von Boden, San Jose; J. F. Galvin, San Francisco; H. Bernhardt, Oakland; M. Johnson, William Mullan, Martin Johnson, San Francisco; P. Donelon, Sacramento; C. Brown, P. J. Cannon, A. E. Daniels, A. Thomas, C. M. McIntyre, C. F. Nelson, F. A. Brenner, P. Norton, J. Peacock, J. Fuite, F. J. Walsh, San Francisco; J. Ponnot, Seattle; Roy H. Craig, Enos Woods, San Francisco; J. W. Reay, New Zealand.

Latest Mining Decisions.

Prepared by Andrews & Murdoch, Berrien Springs, Mich.

That part of land on which a miner located a claim was patented to another without his objection did not prevent him from including the part unappropriated in another claim located on adjoining land, and obtaining a valid title to the claim so established. Erwin vs. Pereo et al., 93 Fed. Rep. (U. S.) 608.

To entitle a lessor to recover substantial damages for failure to operate under a mining lease providing for a royalty on the coal mined as a consideration, the lessor must, in addition to the fact that merchantable coal existed on the land, show that it could be mined with profit, after deducting the royalty. Colorado Fuel & Iron Co. vs. Pryor, 57 Pac. Rep. (Colo.) 51.

A cause of action for money paid, to recover assessments paid on mining stock pending litigation over its ownership, by one of the parties against the other, who was finally adjudged to be the owner, does not accrue until the successful party avails himself of the benefits of the decree by obtaining a transfer of the shares to himself. Irvine vs. Angus et al., 93 Fed. Rep. (U. S.) 629.

Under Const. Utah, Art. 8 § 5, requiring all actions to be tried in the county where they arose, an action to try title to a mining claim, located on land included in another claim on which defendant entered, arose in the county where the land was situated and the entry made, and not in that where the land office in which the defendant's claim was filed was situated. Erwin vs. Pereo et al., 93 Fed. Rep. (U. S.) 608.

The consideration of a mining lease was a royalty on the coal mined and an agreement of the lessee to withhold pay of its employees to cover goods sold them by the lessor should he open a store on the land. Held that, conceding the last agreement to be void as against public policy, the royalty clause was separate and enforceable, and hence the entire lease was not tainted. Colorado Fuel and Iron Co. vs. Pryor, 57 Pac. Rep. (Colo.) 51.

Rev. St. §§ 2319, 2320, 2324, require that, before the locator of a mining claim on public lands shall be entitled to same, he shall have discovered on unappropriated land a mineral-bearing lode, and shall have distinctly marked the boundaries of his claim, so that they may be readily traced. Held that the finding of the lode need not precede the staking of the claim, and hence, where a claim was located, and the locator thereafter discovered a lode thereon before the claim had been appropriated by another, he had a valid claim thereto. Erwin vs. Pereo et al., 93 Fed. Rep. (U. S.) 608.

A claimant of a mining stock, who has been adjudged by a decree of court to hold the same in trust for another, but subject to a lien for advances made by him thereon, does not, by appealing from such decree, place himself in such a position as to render payments to him of assessments made on the stock, pending the appeal, the acts of a volunteer, but on the affirmance of the decree, and the taking advantage of it by the complainant therein, he may recover the amount paid on such assessments as for money paid to the use and benefit of such complainant. Irvine vs. Angus et al., 93 Fed. Rep. (U. S.) 629.

Prospecting near or on lands leased for coal mining failed to disclose coal at the depth it should exist as determined from an adjoining mine. A hole was drilled with a diamond drill near the south line of the land, and an

other near the east line. A six-foot vein was struck at 385 feet in the latter, but in the former no coal of value was found at twice the depth. A slope was commenced on the northeast of the land 2,925 feet from the latter hole, and a six-foot vein opened and exposed several hundred feet toward this land. Several witnesses were of the opinion that this vein extended under the land. Held, that a finding that there was coal on the land was justified. Colorado Fuel and Iron Co. vs. Pryor, 57 Pac. Rep. (Colo.) 51.

To prove coal under leased land was of merchantable quality, witnesses testified that coal from an adjoining slope was not marketable; that the expense of removing the impurities made its mining impracticable. Other witnesses testified that it was good for steam and domestic purposes, and improved as the slope extended into the leased land. It had been mingled and sold with coal from an adjoining mine of the same vein from which thousands of tons had been mined and sold. The lessees kept the water out of the slope for two years after mining stopped, never offered to cancel the lease, or claimed the coal was inferior, but gave as an excuse for not working, that there was no market. Held, that the conflict was such as to prevent disturbing the finding of the trial judge. Colorado Fuel and Iron Co. vs. Pryor, 57 Pac. Rep. (Colo.) 51.

PERSONAL NEWS ITEMS

FREDERICK G. FARISH, lately with the Grand Central Mining Company, Limited, of Minas Prietas, Sonora, Mex., has resigned his position with that company to go to Curay, Colo., where he will take charge of the Humboldt mine.

M. BULKLEY, of HENSHAW, BULKLEY & CO., San Francisco, Cal., has recently returned from a business trip through the east.

GEO. D. BARRON, for nearly ten years past manager for M. Guggenheim's Sons, Aguas Calientes, Mex., has resigned so that he may give more attention to the affairs of the Compania Minera de Beneficiadora de Tezuitlan, of which he is president and treasurer. The company owns some large copper properties near Tezuitlan, Pueblo, Mex.

THOS. RICKERD, of the PARK & LACY CO. of San Francisco, Cal., is at present in Honolulu.

H. GRAFTON VEROE, who has had charge of the Copper King mine, Letcher, Fresno county, Cal., for the past two years, is now superintendent of the Heiskell copper mine, Clovis, Fresno county, Cal.

A. O. IHLENG, of Joplin, Mo., is spending a few days in New York City.

NOEL MONEY, of the London Exploration Co., who has lately been equipping Siberian placer mines for that corporation, is making an inspection tour of California gold mines.

E. M. WADE, of WADE & WADE, Los Angeles, Cal., has just returned from Hedges, Cal., where he has been in charge of the cyanide operations on the American Girl mine.

THOS. N. SMITH, who was connected for many years with the Utica Mine, Angels Camp, Cal., has resigned and removed to San Francisco, where he will practice his profession of mining engineering.

SAMUEL J. HENDY, president and general manager of Joshua Hendy Machine Works, San Francisco, Cal., has returned from his trip through Colorado.

THEOPHILUS ALLEN, superintendent of the Sonora Mining Co., El Oro, Mexico, has recently left for England on a pleasure trip.

P. H. CLINGAN, of Florence, Colo., has charge of the construction of the new Golden Fleece mill at Lake City, Colo.

WALTER B. WILSON, manager of the Elkton Consolidated and El Paso Gold Companies, of Cripple Creek, Colorado, recently left on a visit to London.

Ross E. BROWN, who lately returned from London, England, to San Francisco, is inspecting the Jumper mine, Tuolumne Co., Cal.

The Mining And Metallurgical Journal

THE MARKETS.

All quotations, financial reports and other statistical figures given under this head are New York Quotations, unless otherwise stated in each item. These figures are carefully revised each issue, and constitute a very accurate compilation of statistical matter.

NEW YORK, June 30th, 1899.
The following are the Silver, Copper and Lead quotations for the last two weeks:

	SILVER.	COPPER.	LEAD
June 15.....	60½	18 25	4 45
" 16.....	60½	18 25	4 45
" 17.....	60½	18 25	4 50
" 18.....	60½	18 25	4 50
" 19.....	60½	18 25	4 50
" 20.....	60½	18 25	4 45
" 21.....	60½	18 25	4 45
" 22.....	60½	18 25	4 45
" 23.....	60½	18 00	4 45
" 24.....	60½	18 00	4 45
" 25.....	60½	18 00	4 45
" 26.....	60½	18 00	4 45
" 27.....	60½	18 00	4 50
" 28.....	60½	18 25	4 50
" 29.....	60½	19 25	4 50
" 30.....	60½	18 25	4 45

SILVER

The silver market has ruled dull, but the reports of the shutting down of the Colorado smelter, on account of the labor strike, silver closes higher and stronger, and the possibility of lessened supplies may affect the London market.

COPPER

The copper market continues quiet. The buyers are covered and not inclined to purchase, while no pressure to sell is observable. Lake copper is offered at 18c., but a few transactions are reported at 17½c. Very little is doing in electrolytic copper, the quotation is still 16½c. for cakes, wirebars or ingots, and 16½c. for cathodes, while casting copper is nominal at 16½c. and 16½c.

LEAD.
There is an accumulation of lead in New York City, and free offerings at 4.42½ @ 4.45c. The London market is unchanged, Spanish lead being quoted at £14 3s. 9d. @ £14 5s and English at £14 8s. 9d.

SPELTER.

Under free offerings, prices declined further. Spelter is quoted at 6c. New York, and 5.80c. St. Louis, ordinaries in London being quoted at £27, with specials £27 5s.

ANTIMONY.

Antimony continues in good demand, with prices unchanged at 10½c. for Cookson's, 10c. for Hallett's, "C" U. S. Star and Hungarian.

NICKEL.

Nickel continues unchanged and no alteration of prices can be reported. We quote for ton lots 33½@36c per lb., and for smaller orders 35½@38c. London prices are 14@16d. per lb., according to size of order.

TIN.

The market has moved but sluggishly, and prices have changed little. The London market is quoted in closing at £116 12s. 6d. @ £116 15s. for spot and 17s. 6d. higher for three months, New York is quoted at 25½c.

PLATINUM.

The demand for Platinum is active and prices continue high. We quote for New York \$15.50 per ounce for large lots and \$16@17 for small orders; London is 62@54 oz. ounce.

POTASSIUM CYANIDE.

Purified, 98@99 per cent., in cases of 120 lb. at 30c. per lb. in 5, 10, 25 and 50 lb. tins at an advance.

QUICKSILVER.

The New York quotation remains \$42

per flask. The London price has advanced to £8 5s., with £8 4s. quoted for second hands.

POWDER.

F. o. b., San Francisco: No. 1, 70 per cent. nitro-glycerine per lb. in carload lots, 15½c; less than one ton, 17½c. Black blasting powder in carload lots, minimum car, 728 kegs, \$1.50 per keg; less car lots, \$2 per keg.

COKE.

There has been a quiet trade in coke with a slight improvement reported.

IN CAR LOTS, ST. LOUIS.

Connellsburg fdy coke 72-lb. fry....\$4.70
New River....\$4.00 Pocahontas....3.90
Crushed.....4.70
Gas works coke, lump, per bushel.. .10

BORAX.

The San Francisco market in Borax is firm with a good demand, powdered refined in car lots 7½c.

THE MINOR METALS.

Quotations are given below for New York delivery:

ALUMINUM:
No. 1, 99 per cent. ingots, per lb.....35@37c
No. 2, 99 " " "31@34c
Rolled sheets, per lb.....38c. up
Aluminum—Nickel, per lb.....33@39c
Alum bronze.....20@23c
Bismuth, per lb.....\$1.45@1.50
Phosphorus per lb.....48@50c
Magnesia.....\$2.75@3.00
Tungsten, per lb.....70c
Pero-tungsten, 60 per cent.....60c

Variations in price depend chiefly on the size of the order.

CHEMICALS.

The market is bare of domestic goods, while for foreign alkali the demand is slow, owing to the high price.

Caustic soda is quoted for high test, per 100 lbs., f. o. b., works, \$1.42½ @ \$1.45, New York \$1.66 @ \$1.65. Foreign high test is quoted in New York at \$1.60

@ to \$1.70. Jobbers have made sales of domestic alkali around 85c. per 100 lbs. We quote domestic alkali in bags, per 100 lbs. f. o. b., works, at 62½ @ 65. In New York 80 @ 85c. Foreign quoted in New York at 75 @ 80c. per 100 lbs.

Sal-soda is quoted at 50c. per 100 lbs., works, 60 @ 62½c. is offered in New York for foreign. Bi-carbonate of soda is quoted at \$1.12½ @ \$1.25, and for extr \$3.25 @ 3.50 per 100 lbs., works, with \$2.12½ @ \$2.25 offered for foreign. Chlorate of potash, we quote for crystals, domestic \$8.00 @ \$9.25, and for powdered \$9.50 @ \$9.75. Foreign chlorate of potash is quoted in New York, for crystals, \$9.25 @ \$9.50, and for powdered \$10.00 @ 10.25.

CHLORIDE OF LIME.

English prime brands \$1.60@\$1.70 American, \$1.70@\$1.80; Continental F. \$1.50@\$1.60 per 100 lbs.

ACIDS.

Sulphuric acid is in better request, owing to the warm weather, but blue vitriol is quiet. The other acids are featureless.

BRIMSTONE.

Brimstone is quiet, with no arrivals. We quote for spot, best unmixed seconds, \$21.75 @ \$22.00 per ton, shipment, \$20.50 @ \$20.75. Best thirds are about \$2 less per ton.

NITRATE OF SODA.

Spot is quoted firmer at \$1.92½ @ \$1.65 per 100 lbs, and futures at \$160. Consumers, however, anticipate a lower market, as the quiet season is at hand, but the importers are of a different opinion, and do not seem anxious to sell futures at present. 18,000 bags are now due in New York.

BELTS WILL SLIP — BUT CLING-SURFACE WILL STOP IT PERMANENTLY.

CLING-SURFACE is to be applied to the inside of a belt.

It has been so universally satisfactory for the past three years that we can safely guarantee that its use will not only stop all slipping, but that the belts will become soft and pliable, yet firm; if of leather, they will become as soft as calf skin, and also absolutely water-proof; and furthermore we guarantee that the belts can be run slack, and that the power will be increased so much that in a fair-sized plant the cost of the sample can will be earned monthly.

This applies to all belts, leather, cotton, rubber or a rope drive, whether new, old, or oily. We will send you a sample can for trial; or, if you prefer, we will advise you further as to its nature.

CLING-SURFACE MFG. CO., 167-172 VIRGINIA ST., BUFFALO, N. Y.

REPRESENTED IN SALT LAKE BY THE UTAH RUBBER & MFG. CO.

A Practical Test ...

We asked a man the other day what he thought of our pumps.

"Well," said he, "I've used this pump for twenty years, and it's better than most pumps yet."

The best material, workmanship and patented construction—that's why our pumps wear.

Are you going to buy—Write us for full information and catalogue. All free for the asking.

W. T. GARRATT & CO.,
Pump, Bell, Brass and Machine Works,
138-142 Fremont St., San Francisco, Cal.

Send for Sample Copy of the

Mining and Metallurgical Journal

The Only Exclusive Mining Publication in the West

The Pulsometer Steam Pump

"THE MINER'S FRIEND"

Often Imitated—Never Equalled

Over 20,000 in Use

RECENT IMPORTANT IMPROVEMENTS

The Handiest, Simplest and Most Efficient Steam Pump for General Mining, Quarrying, Railroad, Irrigation, Drainage, Coal Washing, Tank-filling and for Pumping Back Liquids heavily impregnated with sediment. Muddy or gritty liquids handled without injury to the Pump.

AGENTS

PARK & LACY CO., A. M. HOLTER HDW. CO., MITCHELL-LEWIS & S TAVER
San Francisco, Cal. Helena, Mont. Portland, Oregon.

CATALOGUE ON APPLICATION
CORRESPONDENCE SOLICITED

Pulsometer Steam Pump Co.

133 Greenwich Street, New York City

FINANCIAL NOTES.

Average Prices of Metals

Month	Copper	Tin	Lead	Spelter
January	14.75	22.48	4.18	5.34
February	18.59	24.20	4.49	6.28
March	17.54	23.82	4.37	6.31
April	18.93	24.98	4.31	6.67
May	18.25	25.76	4.44	6.88
June	—	—	—	—
July	—	—	—	—
August	—	—	—	—
September	—	—	—	—
October	—	—	—	—
November	—	—	—	—
December	—	—	—	—
Average	—	—	—	—

Average Monthly Prices of Silver.

In New York per ounce Troy, from January 1st, 1899, and for the years 1888 and 1897:

Month	1897	1888	1897
January	59.36	56.77	64.79
February	59.42	56.07	64.67
March	59.64	51.90	63.06
April	60.10	56.02	61.85
May	61.23	56.98	60.42
June	58.61	60.10	—
July	59.66	59.61	—
August	59.54	54.19	—
September	60.68	55.24	—
October	60.42	57.57	—
November	60.60	57.91	—
December	59.42	58.01	—
Year	58.26	59.79	—

Comparative statement of the circulation in the United States on May 1st, 1899. Comparison being made with statement on April 1st, 1899.

May 1.	Changes
Gold	\$701,077,442
Silver	133,507,510
Legal Tenders	312,057,405
Treasury & N.T.B.'s Notes	332,426,248
Total	\$1,479,378,614
I.	\$ 5,633,227

Gold and Silver certificates and currency are not included in this table. By adding the amounts given in this table with those in the following will give the total amount coined or issued. The

figures herewith are furnished by the Bureau of Statistics Treasury Department.

Comparative statement of changes of money in United States Treasury during April 1899, comparison being made with statement, on April 1st, 1899.

May 1.	Changes
Gold	\$155,355,369
Silver	419,739,464
Legal Tenders	34,623,611
Treasury & N.T.B.'s Notes	4,878,740
Total	\$617,388,124
I.	\$ 5,177,633

The Gold and Silver bullion on hand in the Treasury is not included in this statement.

Gold and Silver Exports and Imports.

At all United States ports, for the month of April, 1899, and ten months ending April, 1898, and 1899:

APRIL	
Gold	1868
Exports	\$1,333,724
Imports	32,579,853
Excess	I. \$31,256,134
Silver	—
Exports	\$4,099,161
Imports	2,091,066
Excess	E. \$2,008,095

TEN MONTHS ENDING APRIL.	
Gold	1868
Exports	\$14,921,705
Imports	103,735,951
Excess	I. \$88,17,246
Silver	—
Exports	\$46,764,157
Imports	27,324,499
Excess	E. \$19,439,658

This statement includes the exports and imports at all United States ports, the figures being furnished by the Bureau of Statistics of the Treasury Department.

The Cleveland Mining and Stock Exchange Co.

New England Building, Cleveland, Ohio.

A Reliable Information Bureau for Miners and Investors to obtain FACTS Regarding Capital and Mines. Stocks and Mines listed. Send for prospectus.

Morgan-Watson Mining and Construction Co.

809-810 New England Building, Cleveland, Ohio

MINES AND STOCKS { We Buy, Sell, Lease and Bond Mines of all kinds.
We Buy, Sell, and Negotiate sales of mining and other stocks.
We Furnish Machinery to work good mines under special arrangement.
We Furnish Capital to develop mines.**JAMES IRVING & CO.**
REFINERS

Largest and most complete establishment in Southern California Cyanide and Mill Test.



Mint Prices paid for Gold and Silver Bullion. Returns made within four hours after receipt.

128 N. Main Street

(Old Location.)

Los Angeles, Cal.

ALL THE MINING CAMPS OF UTAH AND COLORADO ARE LOCATED ON OR REACHED BY

The Rio Grande Western Ry.

THE SHORTEST, QUICKEST AND MOST DIRECT ROUTE TO

MERCUR AND CRIPPLE CREEK**MERCUR:**

The Johannesburg of America, New and Wonderful Camp only 45 miles from Salt Lake City, Utah.

CRIPPLE CREEK:

The Greatest Gold Camp in the World, only six years old and two hundred shipping mines in the district.

F. A. WARDLICH,

GENERAL PASSENGER AGENT,

Salt Lake City, Utah

*** * * WANTS * * ***

Advertisements of this class containing not more than five lines will be inserted for not exceeding three months in any year, free of charge, to all paid-up annual subscribers.

Other than above \$1.00 per month.
Advertisements not accepted for less than one month.**COPPER MINE.** State full particulars in regard to development work, location, distance from water, price of fuel, character of ore and returns from shipments. Must have at least 1500 feet of development work. Send all information possible. Address,JAMES HOWARD,
Care JOURNAL Office,
150 Nassau St., New York, N. Y.**GOLD** mine anywhere in **United States**, must have at least 1000 feet of development; where coal is not over \$6.00 per ton or wood \$4.00 per cord delivered; plenty of water; no objection to low grade ore if profit can be made by having large plant to amalgamate and concentrate; want 6 months working bond; no property considered unless owners are prepared to deposit certified check for expenses of engineer if property is not as represented. Address with price and full particularsJ. E. M., Journal Office,
150 Nassau Street, New York, N. Y.**METALLURGIST** and Chemist, ten years experience, assaying, ore buying and smelting, at present engaged with large pyritic smelting company in Mexico, desires engagement in the States or British Columbia. Address: "W. H. C." JOURNAL Office.**NOTICE TO STEAM USERS.**

The National Association of Stationary Engineers is prepared to furnish Engineers of guaranteed ability for any plant in the city or elsewhere. Give us a call. Address: J. T. CHAMBERS, Sec'y, Engine Room City Hall.

Tel. Main 557. Los Angeles, Cal.

METALLURGIST and experienced Assayer and Chemist, with practical experience in Copper and Lead smelting, desires position. Speaks Spanish, highest references, address "Globe", JOURNAL Office.**FOR SALE!****A GROUP** of 4 Copper claims in Northern Arizona. By-product of gold and silver, recently discovered and show great promise will sell at a great bargain.

E. R. HOTSPENFILER,

DEWEY, ARIZ.

TREMAIN Two Stamp Steam Mill at Tucson, Arizona. 15-H. P. Boiler Pump and every thing complete; set up ready for work. In excellent condition, used less than six months. Address DREDGING MINING MACHINERY CO., Kansas City, Mo.**ANTIMONY BISMUTH**

PROSPECTORS having locations of this nature and wishing to sell at once for cash, will do well to address with full particulars.

P. O. Box 2078

SAN FRANCISCO, CAL.

A VERY valuable, extensive Lead Mining Property in Southwest Virginia. Shafts sunk over 200 feet and actual work has demonstrated richness of veins and purity of ore.

Address: GEORGE FRANKE, Baltimore, Md.

FOR SALE AT A BARGAIN.**A 60-TON** copper smelting Plant, consisting of two 30 ton furnaces, one of which has new seamless liner. Plant is complete in every detail. Also an 80-ton Silver-Lead Furnace, entirely new, never having been set up. All of the above located immediately adjacent to railroad. Enquire of GARDNER, WORTHEN & GOSS, dealers in Mining and Mill Supplies, Tucson, A. T.**ORE TESTING**

Complete mill for testing ores on practical scale by all processes to determine the best process adapted to treating any ore submitted. Processes in use investigated to overcome unnecessary losses, etc.

RICKETTS & BANKS,

Metallurgists & Chemists

NEW YORK CITY

See

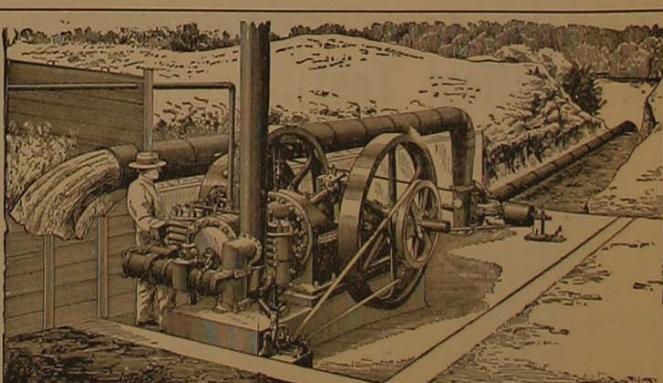
Mining Stock Quotations

Page 21

John Wigmore & Sons Co.**MACHINERY**
Mine and Mill Supplies, Iron and Steel

117 to 123 S. Los Angeles Street,

LOS ANGELES, CAL.

**LARGEST GASOLINE PUMPING PLANT IN THE WORLD**

The illustration shows the gigantic pumping plant recently built by the Hercules Gas Engine Works on the Packer Ranch, Colusa Co., 80 h. p. Hercules Engine, pumping 7200 gallons a minute, 27 feet high. Burns Gasoline or Distilled oil. Cheapest power known. Gas, Gasoline and Oil Engines, 2 to 200 h. p. Send for Catalogue. HERCULES GAS ENGINE WORKS, 210 Bay St., San Francisco.

MINING STOCK QUOTATIONS

BOSTON

Adventure	10 00	Mass	11 00
Aetna	4 00	Merced	9 00
Allouez	8 50	Mohawk	26 50
Anaconda	50 53	Napa Quicksilver	9 25
Arcadian	50 00	Old Colony Min	10 25
Arnold	15 12½	Old Dominion	37 00
Atlantic	31 00	Oseola	83 00
Baltic	87 09	Pioneer	51 50
Bingham	11 00	Quincy	2 50
Bonanza	2 50	Rhode Island	180 00
Boston & Mont'g	40	Santa Fe	13 25
Breeze	2 00	Santa Ysabel	11 37½
Butte & Boston	73 50	Tamarack	200 00
Calmet & Hecla	35	Tecumseh	5 25
Centennial	33 75	Tri-Mountain	10 75
Cochiti	12 00	Victor	3 50
Copper Range	10 00	Victoria	5 50
Crescent	20 00	United States	21 00
Diamond Pref.	116 00	Utah Mining	41 00
Franklin	18 00	Vermont Mint	2 25
Gold Dredging	34 50	White Knob	11 50
Humboldt	2 75	Winona	14 00
Iste Royale	45 00	Wolverine	43 25
Melones	4 00	Wyandotte	6 00

ROSSLAND, BRITISH COLUMBIA.

Brand'n & G'd Crk	30	Kootenay Gold F.	-
Brit.-Amer. Cor.	8 25	Lerwick	-
Brit.-Col. Cor.	8 00	Lily May	-
Canad G'd Fields	10	Lon & Van M. D. Co.	-
Cariboo	1 30	London B. C. G. F.	8 00
Commander	-	Monte Cristo	-
Deep Park	-	New G'd Fld's B. C. 5 00	-
Diamond	23 00	Novelty	-
Evening Star	19 00	Queen Bess Prop.	3 75
Fern	50	Rambler Con	35
Gold Fields of B. C. 5 00	Red Mount, View	-	-
Hattie Brown	-	Reco	-
Hall Mines	2 75	Silver Bell	-
Homestake	0 05	Silver Queen	15
Iron Horse	12 00	St. Elm	-
Iron Mask	75	Slocan Star	-
Josie	-	Vic. Tr. M. Dev. Co.	-
Jumbo	-	Waverly Mines	20
Kenneth	-	War Eagle Con	3 75
Keystone	-	White Bear	10

SAN FRANCISCO.

Alta Con	00	Mexican	48
Andes	11	Occidental	25
Belcher	34	Ophir	1 65
Best & Belcher	45	Overman	-
Bullion	06	Ontario	-
Caledonia	87	Plymouth	-
Challenge	38	Potosi	26
Chollar	28	Quicksilver	-
Confidence	1 00	Quicksilver pref'd	-
Con. Cal. & Va.	1 50	Savage	24
Crown Point	28	Seg. Belcher	07
Deadwood	-	Sierra Nevada	68

COLORADO SPRINGS STOCKS

Gould & Curry	25	Silver Hill	02
Hale & Norcross	34	Standard	2 49
Homestake	-	Union Con	37
Iron Silver	-	Utah	14
Justice	17	Yellow Jacket	36

NEW YORK.

Adams Con	10	Isabella	86
Alamo	97	Iron Silver	55
Alliance	75	Jefferson	97½
Anacondas	50 00	Jessie	92
Anaconda Gold	50 00	King & Pemb	18
Anchoria L.	59½	Lendville Cons.	88
Argentum Junata	25	Little Chief	17
Belcher	38	Mexican	45
Best & Belcher	50	Mollie Gibson	24
Burt Gold	-	Mt. Rosa	18½
Breece	1 60	Occidental	25
Brunswick	15	Ontario	8 00
Chollar	34	Ophir	1 00
Chrysolite	08	Pharmacist	05
Comstock Tunnel	04	Phoenix	10
Comstock Stocks	06	Portland	1 00
Con. Cal. & Va.	1 71	Potosi	37
Cr. & Cr. Creek	04	Quicksilver	2 25
Crescent	15	Rocky Mountain	8 13
Cripple Creek Con	10	San Juan Star	-
Deadwood Terra	50	Savage	29
Enterprise	39	Sierra Nevada	65
Eldorado Cons.	50	Standard Hope	1 25
Elderton Cons.	50	Specimen	-
Good Samaritan	-	Standard Con	2 25
Gold Coin Cr. Cr.	1 85	Syndicate	-
Gold Coin Gilpin	35	Union Con	35
Golden fleece	38	Union	18
Golden Fleece	31	Uish Con	10
Gold King	85	Union	19½
Gould	17½	Vindicator	-
Granite Hill	-	Work	17
Fanny B.	0035	Yellow Jacket	38
Favorite	-	Horn Silver	1 60
Findley	11½	Rattler	-
Flower of the West	02	Specimen	06
Gold Fleece	31	Theresa	-
Gold King	85	Trachyte	04
Groome	01	Vigilant	-
Hale & Norcross	-	High Five	24
Homestake	60 00	Homestake	60 00
Horn Silver	-	Yellow Jacket	-

SALT LAKE CITY

Alice	80	Joe Bowers	12½
Ajax	1 35	Joe Bowers Ex.	12½
Alliance	10	La Reina	88
Anchor	-	Little Pittsburg	08½
Buckeye	03½	Lower Mammoth	46½
Bullion Beck	5 99	May Day	65
Cent. Eureka	40 00	Mammoth	2 00
Chloride Point	75	Mercer	7 40
Daisy	21	Northern Light	.65
Dalton	02½	Omaha	40
Dalton & Lark	09½	Ontario	6 50
Daly	1 35½	Petro	71
Day West	9 00	Rich, Anaconda	.07
Dexter	2 25	Sacramento	46
Eagle & Blue Bell	1 32½	Shower Con	38
Emerald	12	Star Consolidated	40 00
Four Aces	21	Sunbeam	35
Galena	28	Sunshine	60
Geyser-Marion	62½	Swanson	3 85
Golden Eagle	05½	So. Swanson	1 45
Grand Central	8 00	Tetro	05
Homestake	10½	Utah	92
Horn Silver	1 50	Valeo	1 09½
Ingot	25	West M'tn Placer	25

SPOKANE, WASHINGTON.

Ben Hur	28	Number Six	12
Black Tail	17	Palo Alto	14½
Bryan and Sewall	05	Pearl	12
Butte and Boston	17½	Pocahontas	04
Eardman	03	Princes Maude	16
Eureka First Th't	05	Quill	18
Eureka Queen	08½	Rebate	19
Golden Harvest	07½	Republic	3 75
Gold Leaf	05	Republic Big Six	01½
Iron Monitor	09½	Republic No. 2	03½
Jim Blaine	57	Reynold	85
Liberator	04	Surprise	12
Lone Pine Gons	42½	Thoughtful	02
Merimac	03½	Tom Thumb	22
Monroe	08	Trade Dollar	12
Morning Glory	20	Treasury	05
Mountain Lion	87½		

DENVER STOCK REPORT.

Aetna	-	Keystone	03½
Anchoria Leland	83½	Lillie	-
Anaconda	49 00	Mata	24½
Arcadia	03½	Mollie Gibson	25
Argentum Junata	25	Moon Anchor	50
Banner	01½	Mt. Rosa	20

MEXICO

Name of Company	State	Price
Amistad y Concordia	Hidalgo	31
Argentina	Guerrero	370
Arenvalo y Arexas	Hidalgo	200
Asturias y Arexas	Zacatecas	50
Barradon y Cahras	Durango	50
Bariolote de Medina	Hidalgo	70
Cabezon y An	Zacatecas	15
Candelaria de Pinos	Carmen	90
Capuzaya	Durango	30
Carmen	Hidalgo	165
Concepcion y Arexas	Guanajuato	320
Coronas	Mexico	75
El Oro	Guanajuato	30
El Oro, pref.	Mexico	1,750
Española y An.	Chihuahua	50
Guadalupe	Guadalajara	50
Luz de Borda Aviado	Michoacan	22
Luz de Borda aviado	Michoacan	20
Luz de Maravillas	Hidalgo	180
Pabellon	Zacatecas	20
Palma de Sombr	Zacatecas	30
Pioches	Durango	2,000
Rafael y Annexes	Hidalgo	1,000
Real del Monte	Hidalgo	750
Restauradora	Durango	20
Rosario y Annexes	Durango	10
San Francisco	Hidalgo	180
San Rafael aviado	Hidalgo	20
San Angel del Oro	Hidalgo	25
San Maria de la Paz	S. Luis Potosi	720
S. Luis Potosi	Hidalgo	370
Soledad	Hidalgo	240
Sorpres	Trinidad	125
Trinidad Aviador	Guadalajara	110
Trinidad Aviado	Puebla	28
Union Hacienda	Hidalgo	380
Zona Min. de Paz	Guadalajara	57

NOTE.—The above Mexican stocks are figured on the basis of Mexican silver

ADOLF FRESE
ENGINEERING INSTRUMENTS
Barometers, Thermometers, Field Glasses, Microscopes and Accessories. Repairing Promptly Done.
126 S. Spring St., LOS ANGELES, CAL.

Information Regarding all Matters

★★ Pertaining to Mining ★★

Will be furnished by the JOURNAL
OFFICES: Stimson Block, Los Angeles, Cal., and 150 Nassau St., New York, N. Y.

At Wholesale Prices

Mining Timbers a Specialty

Write for Prices

FROM CRIPPLE CREEK

AIR COMPRESSORS,
ROCK DRILLS,
Stone Channelers,
The Pohle Air Lift Pump,
Coal Cutters,

THE INGERSOLL-SERGEANT DRILL COMPANY, HAVEMEYER BUILD'G NEW YORK
PARKE & LACY CO., AGENTS, SAN FRANCISCO, CAL.

JAMES F. BURNS, Pres't. JOHN HARNAN, Gen. Mgr.
FRANK O. BECK, Sec'y and Treas.
THE PORTLAND GOLD MINING CO.,
(Stock Transfer Office, Colorado Springs)
Mines at Victor, Colorado.
COLORADO SPRINGS, COLO., May 19, 1898.
The Ingersoll-Sergeant Drill Co.,
Gentlemen:—We bought two years ago one of the largest size of the straight line type of Ingersoll-Sergeant Piston Jet Compressor.
This was found to be too small for our needs about a year ago and we purchased of you a Duplex Corliss machine 16" x 18" x 42" x 42".
This was set in place in our shaft house in the Cripple Creek District, 10,000 feet above the level of the sea, and was running continuously ever since, and at times over ten 1½" Eclipse drills. The steam cylinders were connected to an independent Jet Condenser, for which we are using the mine water, and the resultant economy of operation is very noticeable.
The operation of this Compressor is as near perfect as that of any machine we have ever seen, and this type is well worth the extra cost on account of the great permanent economy in operation.
Our mine is equipped exclusively with your drills and we have only the highest words of praise to give them.
Yours very truly, THE PORTLAND GOLD MINING CO., Jas. A. Burns, President.

INCORPORATED MINES PAYING DIVIDENDS.

NAMES OF MINES		LOCATION	No. of Shares	Capital Stock	Par Value	Amount of last Dividend	Date of Last Dividend	Total Amount Paid in Dividends	Kind of Minerals Produced
1 Aetna Cons.		California	100,000	\$ 500,000	\$ 5	\$ 10	Apr 1899	\$ 170,000	Q.
2 Alamo		Utah	125,000	125,000	1	.02	April 1899	2,500	G., C., I.
3 Alaska, Treadwell		Alaska	200,000	5,000,000	25	37½	Apr 1899	4,070,000	G.
4 Alaska Mexican		Alaska	200,000	1,000,000	5	10	Apr 1899	353,031	G.
5 Anaconda		Montana	1,200,000	30,000,000	25	1 25	May 1899	9,750,000	C.
6 Anchoria Leland		Colorado	600,000	600,000	1	.03	Apr 1899	198,000	G.
7 American Gold		Colorado	300,000	3,000,000	10	.09	Mar 1899	407,000	G. S. L.
8 Argonaut		California	200,000	2,000,000	10	.10	April 1899	208,000	.....
9 Associated		Colorado	1,250,000	1,250,000	1	.01	Dec 1898	72,000	G.
10 Bald Butte		Montana	250,000	250,000	1	.06	May 1899	702,148	G., C. S.
11 Boston & California		California	600,000	600,000	1	.06	March 1899	38,000	.....
12 Boston and Colorado Smelting		Colorado	15,000	750,000	50	5 00	April 1899	375,000	.....
13 Boston & Montana		Montana	150,000	3,750,000	25	.00	May 1899	10,775,000	G., C. S.
14 Breece		Colorado	200,000	5,000,000	25	.05	June 1899	50,000	I.
15 Bullion Beck and Champion		Utah	100,000	1,000,000	10	.10	May 1899	2,368,400	G. S.
16 Bunker Hill and Sullivan		Idaho	300,000	3,000,000	10	.07	May 1899	705,000	S. L.
17 Cariboo		British Col.	800,000	800,000	1	.01½	Feb 1899	248,965	G.
18 Calumet & Hecla		Michigan	10,000	2,500,000	25	20 00	June 1899	62,850,000	C.
19 Centennial Eureka		Utah	30,000	1,500,000	50	.50	May 1899	2,105,000	S. L.
20 Central Lead		Missouri	10,000	1,000,000	100	.50	June 1899	112,000	L.
21 Charleston		S. Carolina	10,000	1,000,000	100	2 00	June 1899	200,000	.....
22 Colorado Smelting		Montana	100,000	1,000,000	10	1 00	Jan 1899	1,945,000	G., S. C.
23 Consolidated Tiger and Poorman		Idaho	1,000,000	1,000,000	1	.02	Dec 1898	20,000	G., S.
24 Creston Leasing		Colorado	1,000,000	1,000,000	1	.01	Dec 1898	54,000	.....
25 Crowned King		Arizona	600,000	6,000,000	10	.02	Dec 1898	232,000	G. S. L.
26 De Lamar		Idaho	40,000	2,000,000	5	.12	May 1899	2,346,000	G. S.
27 Deer Trail No. 2		Washington	1,000,000	1,000,000	1	.0025	May 1899	30,000	.....
28 Doe Run		Missouri	5,000	500,000	100	.50	June 1899	75,000	L.
29 Elkton Consolidated		Colorado	1,250,000	1,250,000	1	.01½	Nov 1898	656,961	G. S.
30 Empire State		Idaho	75,000	750,000	10	.20	June 1899	165,638	.....
31 Enterprise		Colorado	500,000	500,000	1	.05	Sept 1898	900,000	S. L.
32 Fanny Rawlings		Colorado	1,000,000	1,000,000	1	.01	May 1899	10,000	G. S.
33 Ferris-Haggerty		Wyoming	1,000,000	1,000,000	1	.00½	Mar 1899	5,000	C., G. S.
34 Geysse Marion		Utah	300,000	1,500,000	5	.02	Sept 1898	96,000	G.
35 Garfield Consolidated		Colorado	1,200,000	1,200,000	1	.01	May 1899	34,000	G.
36 Goldelin Star		Ontario, Canada	100,000	100,000	1	.01	July 1899	41,000	.....
37 Gold Coin of Victor		Colorado	1,000,000	1,000,000	1	.01	May 1899	200,000	G.
38 Gold King		Colorado	1,000,000	1,000,000	1	.02	May 1899	30,000	G.
39 Golden Cycle		Colorado	200,000	1,000,000	5	.05	June 1899	198,500	.....
40 Grand Central		Utah	250,000	250,000	1	.15	May 1899	493,750	G., S. C. L.
41 Gwin		California	20,000	1,000,000	50	.25	May 1899	66,500	G.
42 Highland		S. Dakota	100,000	10,000,000	100	.20	May 1899	3,884,718	G.
43 Holy Terror		S. Dakota	300,000	300,000	1	.01	Mar 1899	122,000	G.
44 Homestake		S. Dakota	125,000	12,500,000	100	.50	May 1899	7,493,750	G.
45 Horn Silver		Utah	400,000	10,000,000	25	.05	April 1899	5,260,000	S. L.
46 Idaho		British Col.	500,000	500,000	1	.05½	Jan 1899	292,000	.....
47 Isabella		Colorado	2,250,000	2,250,000	1	.06	Feb 1899	405,000	G.
48 Jack Pot		Colorado	1,000,000	1,000,000	1	.02½	Mar 1899	25,000	G.
49 Jamison		California	390,000	3,900,000	10	.10	April 1899	50,700	.....
50 Lake Superior Iron		Michigan	84,000	2,100,000	25	1 00	Feb 1899	736,000	L.
51 Lillie		Colorado	1,000,000	1,000,000	1	.05	June 1899	224,110	G.
52 Modoc		Colorado	500,000	500,000	1	.02	May 1899	130,000	G.
53 Montana Ltd		Montana	660,000	3,300,000	5	.12	Apr 1899	2,997,557	G. S.
54 Montana Ore Purchasing		Montana	40,000	1,000,000	25	1 00	May 1899	1,120,000	.....
55 Morning Star		California	2,400	240,000	100	2 50	May 1899	728,600	G.
56 Mercur		Utah	200,000	5,000,000	25	12½	Jan 1899	1,266,000	G.
57 Mammoth		Utah	400,000	10,000,000	25	.05	Dec 1898	1,350,000	G., S. C. L.
58 Matco		Colorado	1,000,000	1,000,000	1	.02½	Dec 1898	25,000	G.
59 Mead		California	2,000,000	2,000,000	1	.20	Mar 1899	100,000	G.
60 Monument		Colorado	300,000	300,000	1	.01	Dec 1898	12,624	.....
61 Moulton		Montana	400,000	2,000,000	5	.05	Feb 1899	480,000	.....
62 Mt. Shasta		California	20,000	100,000	5	.30	May 1899	6,000	.....
63 New York & Hon. Rosario		Central A.	150,000	1,500,000	10	.10	May 1899	1,050,000	S. G.
64 Napa		California	100,000	700,000	7	.20	Apr 1899	990,000	Q.
65 New Idria Quicksilver		California	100,000	500,000	5	.20	Apr 1899	120,000	Q.
66 North Star		California	200,000	2,000,000	10	.25	Apr 1899	550,000	G.
67 Ophir Hill		Utah	1,000	25,000	25	.00	Dec 1898	20,000	.....
68 Original Empire		California	50,000	5,000,000	100	1 00	May 1899	500,000	G.
69 Osceola		Michigan	50,000	1,250,000	25	3 00	June 1899	2,801,500	C.
70 Parrot		Montana	230,000	2,300,000	10	1 50	May 1899	67,100	.....
71 Pennsylvania Consolidated		California	51,500	5,150,000	10	.05	June 1899	62,500	.....
72 Pioneer		California	100,000	1,000,000	10	12½	Mar 1899	2,197,080	G. S.
73 Portland		Colorado	3,000,000	3,000,000	1	.02	June 1899	45,000	.....
74 Plumbago		California	300,000	300,000	1	.15	Jan 1899	1,845,411	Q.
75 Quicksilver Pref.		California	43,000	4,300,000	100	.50	May 1899	613,867	Q.
76 Quicksilver Consolidated		California	57,000	5,700,000	100	.40	July 1899	10,470,000	C.
77 Quincy		Michigan	100,000	2,500,000	25	3 50	Feb 1899	183,000	G.
78 Republic Consolidated		Washington	3,000,000	3,000,000	1	.01	June 1899	50,000	.....
79 Raftner-Cariboo		British Col.	1,000,000	1,000,000	1	.01	April 1899	25,000	.....
80 Royal Consolidated		British Col.	2,500,000	2,500,000	1	.01	Mar 1899	87,500	G.
81 Sacramento		Utah	1,000,000	5,000,000	5	.00½	June 1899	3,325,000	S.
82 Small Hopes Consolidated		Colorado	250,000	5,000,000	20	.10	Feb 1899	147,500	S. L.
83 South Swansea		Utah	150,000	150,000	1	.05	Apr 1899	1,745,000	G. S.
84 Standard		Idaho	500,000	500,000	1	.08	Apr 1899	3,859,226	G. S.
85 Standard		California	200,000	20,000,000	100	.10	May 1899	2,822,000	L.
86 St. Joseph		Missouri	30,000	3,000,000	10	1 50	Mar 1899	2,975,000	S. L. G.
87 Silver King		Utah	150,000	3,000,000	.20	.25	May 1899	1,155,000	S. L. Z.
88 Smuggler		Colorado	1,000,000	1,000,000	1	.01	June 1899	161,500	S. L.
89 Swansea		Utah	100,000	500,000	5	.05	May 1899	5,910,000	C.
90 Tamarack		Michigan	60,000	1,500,000	15	4 00	June 1899	730,000	G.
91 Tomboy		Colorado	200,000	2,000,000	10	4 00	May 1899	179,000	G.
92 Utah		Utah	100,000	1,000,000	10	.02	Jan 1899	203,000	G.
93 Vindicator		Colorado	1,500,000	1,500,000	1	.05	Apr 1899	309,000	.....
94 War Eagle		British Col.	2,000,000	1,000,000	1	.01½	May 1899	150,000	G.
95 Wolverine		Michigan	60,000	2,500,000	25	1 50	Apr 1899	203,789	G.
96 Yellow Aster		California	100,000	1,000,000	10	.10	May 1899	.....	.....

S. Silver; G. Gold; L. Lead; C. Copper; Q. Quicksilver; I. Iron; Z. Zinc.

N. B.—Companies not listed have not paid a dividend for the last twelve months.

*Paid since consolidation \$30,000; Republic paid \$120,000 under old management.

THE CAMMET CONCENTRATOR

The Most Recently Developed and Scientifically Designed Concentrator on the Market

PRICE, Including All Extra Attachments complete, f. o. b.

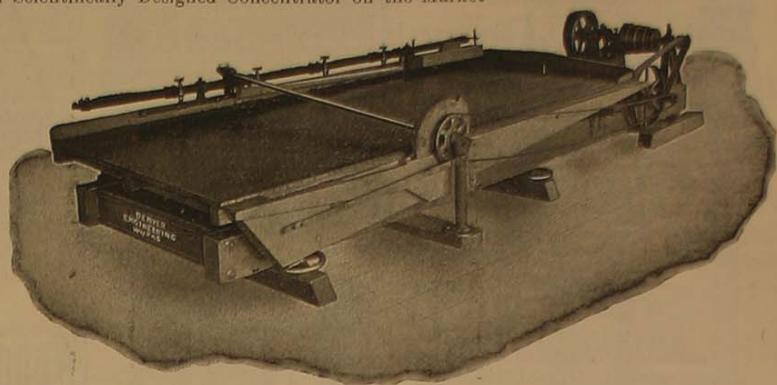
Denver, \$450

We do not tell you that this Concentrator will take the place of two or three Belt Machines—you are supposed to be intelligent enough to know this. We do tell you, however, that this concentrator will do more work than any Concentrator on the market.

Thoroughly protected by strong patents.

**Denver Engineering Works,
Sole Manufacturers.**

Denver, Colorado, U. S. A.



Mining and Smelting Plants

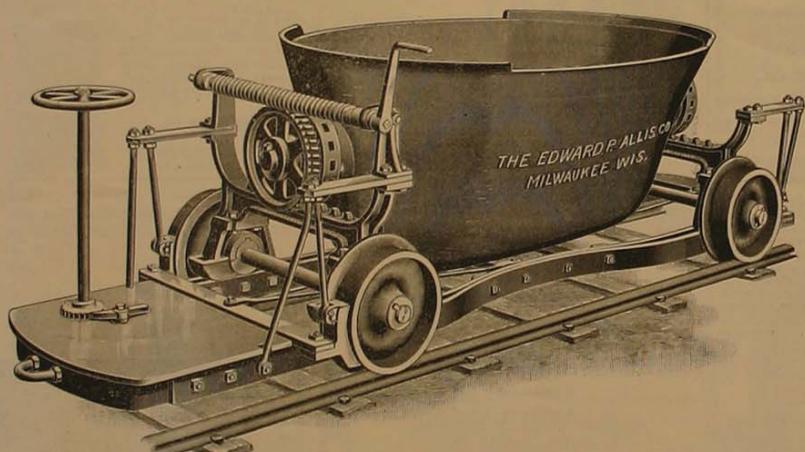
AND THEIR EQUIPMENT

BLAST FURNACES

CALCINING FURNACES

CONVERTERS

BLOWING ENGINES



Slag Truck, 43 Cu. Ft. Capacity

The Edward P. Allis
COMPANY,

MILWAUKEE, - - - WISCONSIN

CATALOGUES ON APPLICATION

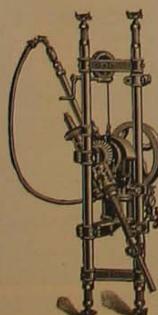
SULLIVAN MACHINERY CO.

CHICAGO, ILLINOIS

Sullivan Diamond Prospecting Drills

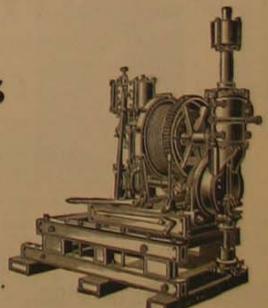
FOR PROSPECTING FOR and DEVELOPING MINERALS

Rock Drills for Sinking, Drifting and Stoping



Knight & Stone, Agents, Spokane, Washington
Denver, Col. Office: 332 Seventeenth Street

Henshaw, Bulkley & Co., Agents, San Francisco, Cal.
New York Office: 71 Broadway





MAKING THINGS RUN SMOOTHLY

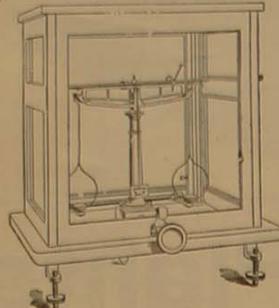
The shop machinery cannot run easily unless the engine which drives it works freely and without friction.

A Detroit Lubricator

on the engine makes it run evenly and without any loss from friction or unnecessary wear. It saves more than it costs every few days and prolongs the life of the engine. Catalogue sent on application, and prices quoted if desired.

DETROIT LUBRICATOR CO., Detroit, Mich.

QUEEN NO. 4 ASSAY BALANCE



Aluminum Beams, Agate Knives and Planes
Sensitivity 1-100 mg. The Best Low-Price Assay
Balance on the Market. Send for Circular.

QUEEN & CO.,
Optical and Scientific Instrument Works
1010 Chestnut Street,
N. Y. Office, 59 Fifth Ave. Philadelphia

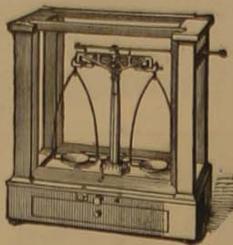
TIMOTHY W. SPRAGUE, S. B.

WITH
CHARLES HENRY DAVIS, C. E.
CONSULTING ENGINEERS
99 CEDAR ST., NEW YORK. 4 STATE ST., BOSTON
DREXEL BLDG., PHILADELPHIA
Electric Transmission of Power and Mine
Equipments

ESTABLISHED IN 1840

HENRY TROEMNER,

170 Market St., Philadelphia, Pa.



Assay Balances and Weights

In use in all the U. S. Assay Offices
in America

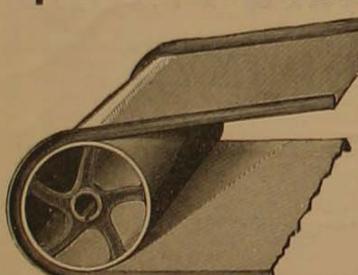
PRICE LIST ON APPLICATION

GASOLINE ENGINES

Gasoline Engines from 2 to 10 horse
power. Mine ventilators operated by
Gasoline Engines.

TEMPLE MACHINE CO.,
1513 Wazee Street, Denver, Colorado

Spadone's Concentrator Belts Patented



This illustration shows the edge flanging outwardly as it passes over the pulley. This reflects the strain from the top and bottom of the edge by directing the strain automatically to the inside face surface of the edges. Heretofore all belts have been so constructed that when they pass over the pulleys or rolls, a direct strain comes upon the top or at the base of the edges, causing the edges to break away from the body of the belts in a very short time. We avoid this Mechanical Defect by our Spadone Curved Edge. Belts made to fit any machine—4½ and 6 feet wide. Prices and samples on application.

Send us your order for Water, Air Drill,
Steam, Suction and Fire HOSE, RUBBER
BELTING, RUBBER PACKING and
LEATHER BELTING.

Amalgam Plate Cleaners. Our Amalgam Plate Cleaners are made of Pure Rubber in moulds, thus insuring a plate cleaner which will not scratch the plates and a perfect edge which will clean the Amalgam plates evenly. They are made 6 inches long, 3 inches wide and $\frac{1}{4}$ in. thick, making a convenient size to handle. Price by mail to any address, each 75c. Correspondence solicited.

The Gutta Percha Rubber & Mfg. Co., 30 and 32 Fremont St., San Francisco, Cal.

Electric Blasting Apparatus.

Adapted for Firing all Kinds of Explosives used in Blasting



**Victor Electric
Platinum Fuses**
Superior to all others for exploding any make of dynamite or blasting powder. Each fuse folded separately and packed in a paper box of 50 each. All tested and warranted. Single and double strength with length of wires.

Blasting Machines.
The strongest and most powerful machines ever made for electric blasting. They are especially adapted for submarine blasting, large



Insulated Wires and Tapes, Blasting Caps, Fuse, Etc.

MANUFACTURED ONLY BY

JAMES MACBETH & CO., 128 Maiden Lane, New York, U. S. A.
BRANCH OFFICE: 308 Market Street, San Francisco, Cal.

THE J. H. MONTGOMERY MACHINERY COMPANY.

1216 TO 1230 CURTIS ST., DENVER, COLO., U.S.A.

More than 4,000 in use. Made of wrought iron and steel. Can be packed on animals anywhere. The deadlock holds the load when an accident occurs.



20-Page Catalogue FREE.

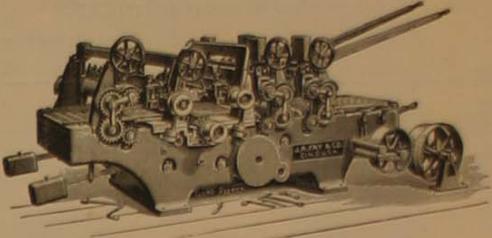
Price of One-Horse Whim, complete, with shieves.....	\$65.
Two-Horse Whims, complete, with shieves.....	\$150
Pumping Attachment with Pipe for either.....	\$40.
Blower Attachment with Pipe for either.....	\$30.
Also Four, Eight and Twelve-horsepower Whims.	

All kinds of New and Second-Hand Machinery

J. A. FAY & EGAN CO. CINCINNATI, OHIO

Wood Working Machinery

FOR —



Box Factories, Planing Mills, Sash, Door & Blind Factories

Carriage, Wagon and Agricultural Shops.

HENSHAW, BULKLEY & CO., Agents, San Francisco, Cal.

From 1 to 40,000 pounds
weight

Of Open Hearth or Chester Steel. True
to Pattern, Sound, Solid. Gearing of all
kinds and Crank Shafts. Shoes, Dies,
Crusher Plates, Bosses, Taffets and Roll
Shells. Steel Castings of every descrip-
tion.

Chester Steel Castings Co.,
Works Chester, Pa., Office, Library St
Phila., Pa.



WHY

Spend your money to buy new machinery to put on Un-
proved Mines which may not be a success when you can
buy Pumps, Hoists, Shafting, Pulleys, Air-Compressors,
Engines, Boilers and in fact any Machinery you need for a
Mine or Mill, as good as new, at the

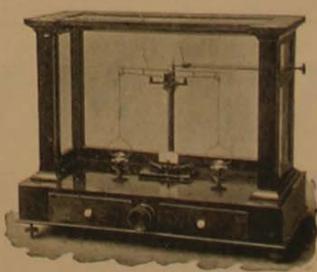
Denver Variety Machine Shops, THOS. CROW, Prop.

1712 Blake St., DENVER, COLORADO

WEIS & GIBSON,
Assayers and
Analytical Chemists

81 Clark St., Chicago, Ill.

Assays and analyses of all kinds. Mail orders
promptly attended to. Mining properties ex-
amined and reported upon. Term on application



ANSWORTH NO. 045

Sensitivity — — — 1-50 milligramme

Eight inch beam, single rider attachment, and
designed for a silver button balance to carry a
heavy load.

Wm. AINSWORTH & SONS
1251 LAWRENCE ST. DENVER, COLO.

JEFFREY
ROLLER, STEEL and SPECIAL CHAINS.
ELEVATORS

AND CONVEYORS
FOR HANDLING MATERIAL OF ALL KINDS.
WIRE CABLE CONVEYORS.

THE JEFFREY MFG. CO. 41 DEY STREET,
Columbus, Ohio.

SEND FOR CATALOGUE

Western Branch, - - Denver, Colorado

Frank R. Field, Manager.



Quartz Screens
A specialty. Round, slot or burred slot holes. Genuine Russia Iron, Homogeneous Steel, Cast Steel or American planished Iron, Zinc, Copper or Brass Screens for all purposes. CALIFORNIA PERFORATING SCREEN CO., 145-147 Beale St., S.F.

Diamond Prospecting Drills.



Machines of all Capacities

American Diamond Rock Drill Co.

120 LIBERTY ST., N.Y.
P. O. Box 1442

The Kootenai Gold Mining District

of British Columbia, which of late has been attracting considerable attention, is best reached by the Oregon Railroad and Navigation Co. The fact has recently been brought out that the Kootenai district contains within its borders more *High Grade Silver and Lead Mines* than any other part of the world. The recent discoveries of *Rich Gold Lodes* makes it the most attractive country for the Capitalist Miner and Prospector to visit in search of mines.

The Oregon Railroad and Navigation Co.
Dispatch Fast Steamers every Four Days

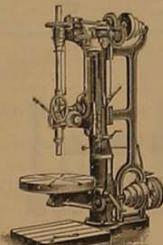
from San Francisco connecting at Portland, Oregon with their rail line for all points in this famous district. For full particulars address,

E. C. WARD, GENERAL AGENT.
630 Market Street, SAN FRANCISCO, CAL

NEW HAVEN MFG. COMPANY

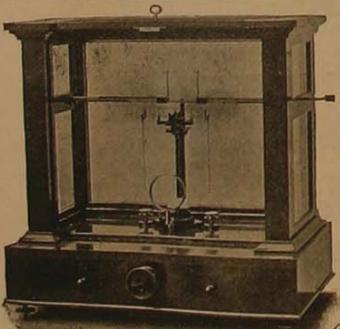
NEW HAVEN CONN.

IRON WORKING TOOLS,



Engine Lathes, Pulley Turning Lathes, Iron Planers, Slotters, Upright Drilling Machines, Horizontal Drilling and Boring Machines, Etc.

HENSHAW, BULKLEY & CO., Agents, San Francisco, Cal.



SMITH & THOMPSON

Manufacturers of

Fine Assay Balances

Write for Catalogue

Denver, Colo.

FOR SALE VERY CHEAP.

2,000 TENTS used a few days at G. A. R. Reunions, etc., every size and shape from a 10x12 wall tent to a 125x175 circus tent, including family compartments tents, refreshment tents, stable tents and preaching tents; also 800 canvas cots and 300 gasoline lamps; guaranteed in first class condition; 1,500 new bed blankets; 1,200 wool horse blankets. Write for prices.

C. J. BAKER,
104 W. 3d St., Kansas City, Mo.

ANTIMONY.

We buy Antimony Ore in any quantity and pay prompt CASH for same. Write us and let us know what you have.

Chapman Smelting Works Co.,
(INCORPORATED)

422 Battery Street. San Francisco, Cal

Independent Assay Office.
ESTABLISHED 1888.
D. W. Reckhart, E. M., Proprietor.
Agent for Oro Slipper.
Agents for Australia.
Mines Examined and Reported Upon.
BULLION WORK A SPECIALTY.
P.O. Box 88, Office and Laboratory
Cor. San Francisco and Clarendon Sts.
EL PASO, TEXAS.

J. B. Pope

U. S. Mineral Surveyor,

SAN BERNARDINO, CAL.



TANKS

OF EVERY DESCRIPTION
FOR —



Mines, Mills and Cyanide Plants
Patent Non-Shrinking Water Tanks

The only Tank that will stand the Desert
and Hot Climate.
Write for Catalogue and Estimate on any kind
of Tank Work.

Pacific Tank Co.

33 BEALE ST., SAN FRANCISCO
348 EAST 2d STREET, LOS ANGELES

To Gold Miners!

Silver Plated Copper AMALGAMATING PLATES

For Saving Gold In Quartz and Placer Mining.

EVERY DESCRIPTION OF MINING PLATES MADE.

Only Best Copper and Refined Silver Used. Old Mining Plates Replated. Twenty-six Medals Awarded.

Gold, Silver, Nickel, Copper & Brass Plating.

Old copper mining plates bought or taken in exchange for new silver-plated plates and full value allowed. Gold extracted from old plates at a moderate cost by a new and economical process. Old plates, which often contain a surplus of gold above the cost of plating, can be re-plated.

DENNISTON'S SAN FRANCISCO PLATING WORKS

653 and 655 Mission Street, San Francisco, Cal.

Telephone, Main 5931.

Proprietor

E. G. DENNISTON,

Send for Circular.

R. A. PEREZ, E. M.

Assayer and Chemist

Manager of the Bi-Metallic Assay Office and Chemical Laboratory

Assaying of Ores, Furnace Products, etc.

Amalgamations and Cyanide Tests Carefully Made

Formerly: Underground and surface surveyor for the Coahuila and Alamo Coal Cos., Coahuila, Mexico.

Assistant Chemist for the Wharton Iron Furnace, Port Orford, N. J.

Chief Assayer for El Paso Smelting Works, El Paso, Texas.

Assistant Chemist Consolidated Kansas City S. and R. Co., Argentine, Kan.

Los Angeles, Cal.

124 South Main Street,

ESTABLISHED 1859

Herman Kohlbush Sr.

59 Nassau Street,
New York, N. Y.

MANUFACTURER OF

Fine Balances and Weights

For every purpose where accuracy is required.

• • •

Send for Illustrated Catalogue

THE WILSON

Forged High Grade Steel

Shoes and Dies

Guaranteed to Wear Longer and Prove Cheaper than any others.
Made by use of Special Appliances. Patented Aug. 16th, 1892.

Made only by

WESTERN FORGE AND ROLLING MILLS

St. Louis, Missouri

JOSHUA HENDY MACHINE WORKS

SOLE AGENTS

San Francisco, Cal.

38 to 44 Fremont Street,

The JACKSON DRILL and M'F'G. CO.

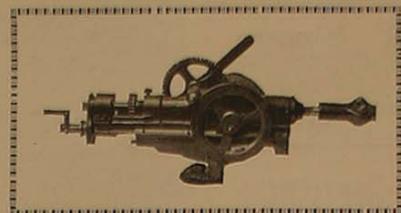
CEDAR WATER GOLD MINING CO., Gen'l Office,
SAGINAW, MICH., November 13, 1898.

The Jackson Drill & Mfg. Co., Denver, Colo.

GENTLEMEN:—Yours of the 10th received. In reply, I have written four of the parties, whose names you have sent, and must confess I got very flattering reports from each.

Yours truly,

(Signed) W. F. STEVENS, Pres.



GENERAL OFFICES:

DENVER COLORADO

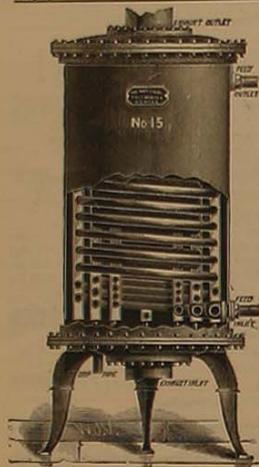
1756 Larimer St.

Sole Licensees for all Foreign Countries and
Eastern United States.

THORNTON N. MOTLEY COMPANY, (Inc.)

43 John St., New York.

Write for Circulars and Testimonials
to your hardware dealer or to
the Company



The National Feed Water Heater

Highest Premium at World's Fair

800,000 HORSE POWER IN USE

SIMPLICITY
CHEAPNESS
RELIABILITY
EFFECTIVENESS

Henshaw, Bulkley & Co.,
Agents,
SAN FRANCISCO, CAL.

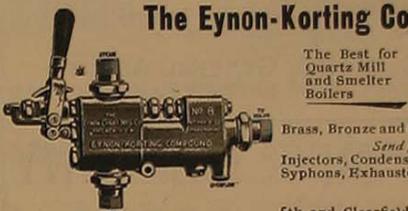
P. & B. PAINT

FOR MINES, SMELTERS, CHLORINATION WORKS,
THE CYANIDE PROCESS.

P. & B. Roofing put up in Rolls to lay 200 square feet, with Paint and Nails.
Absolutely Acid and Alkali Proof.

PARAFFINE PAINT CO., Manufacturers, 312-314 W. 5th St., Los Angeles

The Eynon-Korting Compound Injector



The Best for
Quartz Mill
and Smelter
Boilers



Brass, Bronze and Copper Castings of every description.
Send for Catalogue of the
Injectors, Condensers, Blowers, Ventilators, Blast Nozzles,
Siphons, Exhausters, Etc.,
THE EYNON-EVANS MFG CO.,
5th and Clearfield Streets,
PHILADELPHIA, PA.

ENRIQUE C. CREEL, President

JUAN A. CREEL, Manager

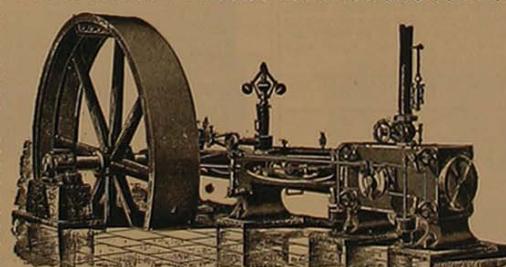
Compania Industrial Mexicana

MANUFACTURERS OF

MINING ⚡ MILLING ⚡ AND ⚡ SMELTING MACHINERY

STAMP MILLS

Engines,
Amalgamating Pans
Hoists,
Huntington Mills,
Cyanide Mills,
Stamp Mill Mortars,
Air Compressors,



Concentrators

Pelton Water Wheels
Water Jacket Smelters,
Pumps,
Rolls and Jigs,
Ore Cars ⚡ Slag Cars
Amalgamating Plates, Cams Shoes-Dies
Boilers, Roasters, Electric Light Machinery.

We are prepared to meet any Prices, for Milling, Smelting and Mining Machinery
Address all communications to the Company. Correspondence Solicited.

Chihuahua,

Mexico

THE CUMMER DRYERS.

**FOR DRYING ...
... EVERYTHING
MECHANICALLY**

Concentrates, ores, coal, bricks, clay, etc.
No Steam is used.

Hundreds in Operation

F. D. CUMMER & SONS CO.,

CLEVELAND, OHIO

Ores! Ores! Ores!!

Gold, Silver and Lead Ores and Concentrates

Purchased at Reduced Rates for Treatment.

Selby Smelting and Lead Co.

416 MONTGOMERY ST., San Francisco

Consign Shipments to Vallejo Junction, Cal.

MINERS' OUTFITS.

IRON MORTARS,
AMALGAM MORTARS,
GOLD WASH PANS,
MINERS' HORNS,
BATEAS, CRUCIBLES,
HORSE-SHOE MAGNETS
MAGNIFYING GLASSES
IRON RETORTS,
CHEMICALS, SCALES,
WEIGHTS, ETC.

Including a full assortment of Mine and Mill Supplies. Assayers' Materials, Etc.

Sole Agents for the Pacific Coast for the
W. S. TYLER WIRE WORKS CO. Manufacturers of

Steel and Brass Wire Battery Screens
Agents for Baker & Adamson's Chemically Pure Acids. A full Stock always on hand.

Nitric Acid, sp. gr. 1.42; Muriatic Acid, sp. gr. 1.30; Sulphuric Acid, sp. gr. 1.845.

JOHN TAYLOR & CO.
63 FIRST ST., SAN FRANCISCO
Prices on application.

RIVETED SHEET STEEL WATER PIPE

For Placers, Water Powers, Irrigation, Etc.

THE WEIGELE PIPE WORKS
2949-51 Larimer St. DENVER, COLO.

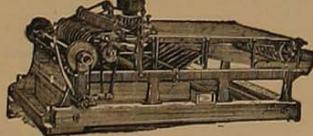
State Ore Sampling Co.

DENVER, COLORADO.

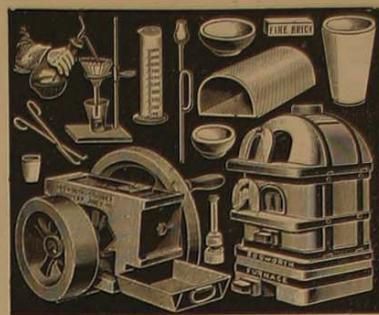
We buy Gold, Silver, Lead, Copper, Bismuth, Uranium, Wolfram, Cobalt, and Antimony Ores. We have modern mills for sampling ore. We also test ores for the new processes of reduction. Our long experience in the market enables us to pay the highest cash prices for all marketable ore. Write for our "Reference Book." Send analysis of your ore for prices and information.

BAILY & MONNIG, Managers.

WOODBURY CONCENTRATOR



No. 141 First St., - San Francisco



FACTORY:

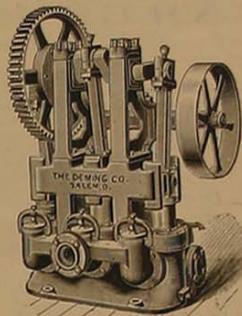
3101-3141 Blake St., 1742-1746 Champa St., Denver, Col.

THE DEMING

TRIPLEX POWER PUMP

The Best Made

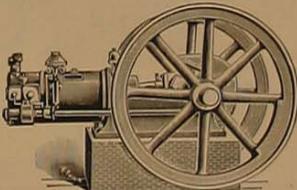
Steel Crank Shafts, Cut Gearing, Outside
Packed Plungers, Single and Double
Acting Triplex Electric Pumps



THE OTTO GAS ENGINE

51000 IN ACTUAL USE

The Original, the Highest Efficiency and
Most Economical



Henshaw, Bulkley & Co.,

AGENTS

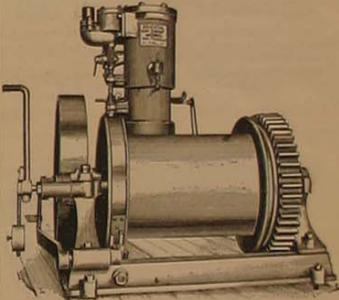
SAN FRANCISCO, CAL.

E. E. BURLINGAME & CO., ASSAY OFFICE AND CHEMICAL LABORATORY

Established in Colorado, 1866. Samples by mail or express will receive prompt and careful attention. Gold & Silver Bullion Refined, Melted and Assayed OR PURCHASED. Concentration Tests — 100 lbs. or car load lots. Write for terms. 1736-1738 Lawrence St., Denver, Colo.

**CLARENCE HERSEY,
Assayer and Chemist,**
(Established 1879)
LEADVILLE, COLORADO
Samples by Mail or Express Receive Prompt Attention

SPECIMEN ASSAY PRICES:
Gold silver and lead, \$1.00; any two of the above, 75c; any one of above, 50c; copper analysis, \$1; platinum, nickel or tin, \$5.00.
Write for full price list and mailing envelopes



ORIENTAL HOIST

Any Size Built on Demand
Simplest and Best Mining Hoist Built
Write for Particulars and Prices

Oriental Gas Engine Co.

105 BEAL ST., SAN FRANCISCO, U.S.A.

WHITE, ROGERS & COM'Y.

CONSTRUCTING ENGINEERS AND MILLWRIGHTS

806 PINE STREET, SAN FRANCISCO, CAL.

Sole Pacific Coast Agents and Builders of the Celebrated

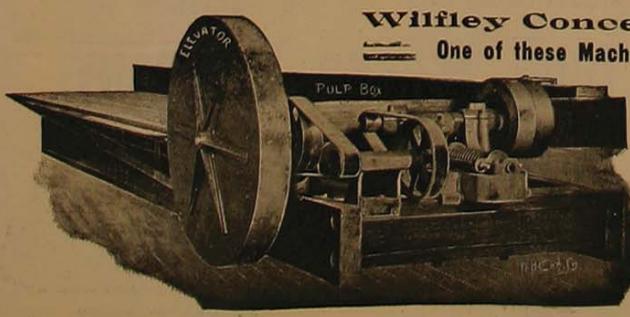
Willfley Concentrator, Price \$450 f.o.b. San Francisco

One of these Machines will take the place of TWO or THREE Belt Concentrators of any make and do very much better work.

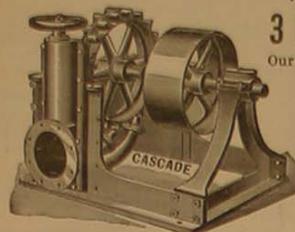
We furnish superior Machinery and erect Stamp Mills, Hoisting and Pumping Works operated by Steam or Water Motors. Complete Concentrating and Smelting Plants for the concentration and recovery of gold, silver, copper and lead. Improved Power Drills and Air Compressors, Wire Rope Tramways, etc.

The Willfley Table is fully covered by U. S. Patents Nos. 580,338 and 590,675. Infringements will be prosecuted to the full extent of the law.

These Machines are Kept in Stock Ready for Immediate Shipment



Turbine AND Cascade WATER WHEEL



Adapted to all Heads from

3 Feet to 2000 Feet

Our experience of 33 YEARS building Water Wheels enables us to suit every requirement of Water Power Plants. We guarantee satisfaction.

Send for a Pamphlet of either Wheel and write full particulars.

James Leffel & Co.
SPRINGFIELD, OHIO, U.S.A.



\$35,000,000 in Dividends paid out by Utah Mines up to date.

UTAH MINING STOCKS

Weekly Market Report on application. Quotations by wire or mail. Reference: Any Bank in Salt Lake City.

P. J. CONWAY & CO.,

SALT LAKE CITY, UTAH

CONGREVE Boiler Compound

WILL REMOVE SCALE GREASE and DIRT from Steam Boilers without injury to the steel.

The Compound is Free from Acid
Write for Circulars

Address, Congreve Boiler Compound Co.,
Lucas Avenue, St. Louis, Mo.

Prospector's Field Book and Guide

In the search for and the easy determination of other useful minerals by H. S. Osborn, of 58 engravings, 274 pages, by mail \$1.50. Catalogue M, Mining, Assaying, etc., sent free.

PHILADELPHIA BOOK CO.
15 S. Ninth Street, Philadelphia, Pa.



THEODOR LEXOW
Nos. 12 to 16 John St., near Broadway, N. Y.
Importers of CARBONS
FOR DIAMOND DRILLS and all Mechanics Purposes
Henry Demmert

Mathematical, Scientific and Drawing Instruments

Boxwood Scales. All kinds of repairing promptly executed.
GUIDO FERRARI

S. E. Cor 7th & Chestnut Sts. Philadelphia, Pa.

GOLD and SILVER REFINERS & ASSAYERS.

Bullion Bought. No charges for parting: Gold \$20.30 per oz., Silver and Platinum at market prices. Assaying in all branches. Working tests made by all processes. Wastes and Concentrates bought. Prompt attention. Best Services. Your Trade Solicited

PENN SMELTING AND REFINING WORKS, 901-903 Filbert St PHILADELPHIA, PA.



PERFORATED Screens

Steel Plate, Copper and Bronze

For all uses. Send for Catalogue
A. J. BECKLEY & CO.
Works, Garwood, N. J.

New York Office, 123 Liberty Street.

L. Manasse Company

Mfg. Opticians



88 Madison Street Chicago.

Manufacturers and Importers of Architects, Engineers and Surveyors Supplies.

Optical instruments of every description. Barometers, Thermometers, Field Glasses, etc. Catalogues on application.

W. H. TONKIN GEO. G. McNAMARA
McNamara & Tonkin, ASSAYERS AND ANALYTICAL CHEMISTS
General Brokers, Mining and Milling Engineers. Reference, 1st National Bank, Offices, Metallurgical Works and Laboratory:
129 S. Broadway, Los Angeles, Cal.

Analytical Chemists and Assayers

Analysis made of ORES, Waters, Chemicals, Clays, &c. Umpire Work a Specialty
HAMMON & MORRISON,

144 Chestnut Street, PHILADELPHIA, PA.

JOHN. T. REED

Assayer and Analytical Chemist

Assays made for all valuable metals. Analysis made of all valuable minerals. Special attention given to the sampling of mines. Estimating the value of and testing the nature of their ores, no pound lots of ore sampled, and working tests made by Cyanide, Amalgamation and Chlorination Processes.

OFFICE 522 COURT STREET,
San Bernardino, - - California

SUPERIOR STRENGTH
FREEDOM FROM SMOKE

OLIVER'S POWDER METEOR DYNAMITE

Extra Strength for Heavy Rock Work and Ore Mining



GELATINE

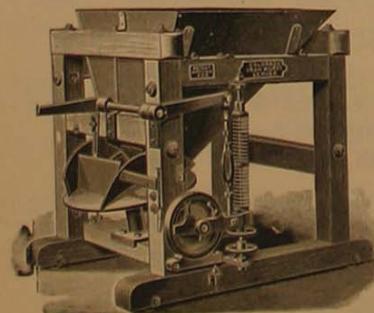
The OLIVER POWDER CO.,
OLIVER MILLS,
LUZ. COUNTY, P. A.

OLIVER'S

FLAMELESS
DYNAMITE

Will not Ignite Gas or Coal Dust. Does not shatter coal
ALL GRADES OF MINING POWDERS A SPECIALTY

Mining, Milling, Smelting,
Concentrating, Chlorination,
and Leaching Machinery

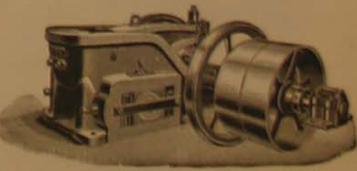


CHALLENGE ECLIPSE ORE FEEDER
Will feed both wet and dry ores

MANUFACTURED BY

THE COLORADO IRON WORKS COMPANY

DENVER, COLORADO.



CATALOGUE ON APPLICATION

BLACK HAWK ORE BREAKER

The Globe .. Machine Works

High Grade Machinery.

Repairing. Make a specialty of building the Best Engine in the United States.

137-139 W. 2d St., Cincinnati, O.

SEE Incorporated Mines Paying Dividends, PAGE 22

Perforated Metals

GRIZZLEYS FOR PLACER MINING, BATTERY SCREENS
STEEL SHEETS FOR TROMMELS.

THE ROBT. AITCHISON PERFORATED METAL CO.
269 Dearborn St., Chicago, Illinois

FRANCIS SMITH & CO.,
MANUFACTURERS OF

SHEET IRON & STEEL PIPE

MINING PIPE ALL SIZES

Hydraulic, Irrigation and Power Plants, Well Pipe, Etc., all Sizes.
Iron cut, punched and formed, or making pipe on ground where required. All kinds of Tools supplied for making Pipe. Estimates given when required. Are prepared for coating all sizes of Pipes with Asphaltum.

46 Fremont Street

San Francisco, Cal.

HOME MANUFACTURE

FOWLER'S
Air Space and Asbestos
Manufacturing Company

Sectional Removable Covering
for Steam Boilers, Pipes, etc.
As a Non-Conductor, Unequalled
Absolutely Fire Proof!



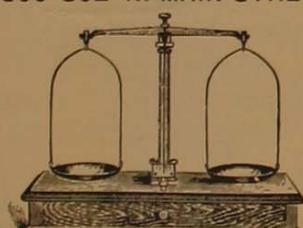
G. C. FOWLER, 656-58 Howard Street
SAN FRANCISCO, CAL.

C. DUCOMMUN,

300-302 N. MAIN STREET,

LOS ANGELES

Assayers Material
Mine and Mill Supplies

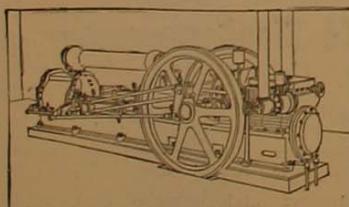


Dixon's Black Lead Crucibles, Denver Fire Clay Crucibles, Muffles, Scorifiers, etc.; Quicksilver, Drill Steel, Retorts, Mortars, Gold Pans, Drilling Hammers, Drifting Picks, Horn Spoons and Shovels.

NORWALK IRON WORKS CO.

SOUTH NORWALK, CONNECTICUT.

THE NORWALK AIR and GAS COMPRESSOR



In use in every State in the Union, Central America, and South America, Great Britain, etc., Also used by the U. S. Army and Navy.

Especially Designed for
Driving

ROCK DRILLS,
PNEUMATIC LOCOMOTIVES, ENGINES, PUMPS
COAL CUTTERS.

and Other Mining Machinery. The Best Machine for Compressing Air for all Dynamic Purposes.
Send for Illustrated Descriptive Catalogue.

HENSHAW, BULKLEY & CO., Agents San Francisco

Eastern Prices Beaten

Improved Facilities, Finest Work Lowest Prices



Perforated Sheet Metals

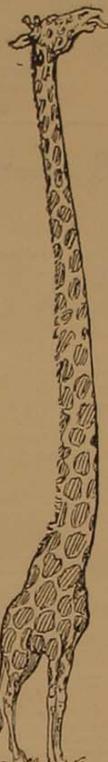
For Flour and Rice Mills, Grain Separators, Shaker Screens, Gravel and Cement, Stamp Batteries, Iron, Steel, Russian Iron, American Planish, Zinc, Copper and Brass Screens, for all uses.

San Francisco Pioneer Screen Works

(ESTABLISHED 1860)
221 and 223 First St., San Francisco, Cal.
JOHN W. QUICK, PROPRIETOR

A Comparison ...

Compare the



MINING AND METALLURGICAL JOURNAL

with others published in the West, and you will find it head and shoulders above them all.

WRITE FOR ADVERTISING
RATES

OFFICES:

Stimson Block, Los Angeles, Cal.

150 Nassau Street, New York

N. OHLANDT & CO.

MANUFACTURERS OF

Best Quality of BONE ASH for Assayers.

Our Goods are used in all parts of the United States and Mexico.

EXTRA No. 1 and No. 2

CORRESPONDENCE SOLICITED

327 MARKET STREET, SANFRANCISCO, CAL.

The. M. and E. Co.

Machinery & Supplies

Mining Hoists--Geared & Friction

Engines

"Oil City" Boilers

"GEARY"
WATER TUBE

"SNOW" Mine and Sinking
LAWRENCE Centrifugal
RUMSEY Power

Pumps

Shafting, Belting, Pulleys, Hangers, Boxes, Etc. Write for Prices

The Machinery and Electrical Company,

351 & 353 N. Main Street,

Los Angeles, Cal.

Buyers of
ALL CLASSES OF
BULLION, MATTE,
ORE, SILVER SUL-
PHIDES,
CYANIDES, GOLD
and SILVER BARS.

CONSOLIDATED Kansas City Smelting AND Refining COMPANY

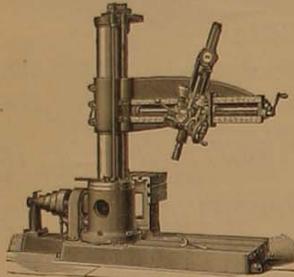
SMELTING WORKS
LEADVILLE, COLO.; EL PASO, TEXAS;
ARGENTINE, KAN.; BOQUILLAS, MEX.

REFINERY:
ARGENTINE, KANSAS

ORE PURCHASING AGENCIES:
C. D. Porter, Spokane Wash.; J. H. Weddle, Leadville, Col.;
J. H. Murray, Denver, Colo.; L. P. Feuerstein, City of Mex.;
J. E. Jackson, Salt Lake City, Utah; H. R. Simpson, El Paso, Texas; C. E. Flinney, Argentine, Kansas.

Manufacturers of
ALCHEMIST-
BRAND
BLUE VITROL
ZINC SULPHATE

Half Universal Radial Drills



The special features which have so highly recommended this style of Drills are our double columns, steel gearing, power and hand feeds, quick return motion to spindle. Furnished in three sizes, with large variety of tables, adapting the drills for every class of work possible.

Bickford Drill and Tool Co.

CINCINNATI, OHIO, U. S. A.

HENSHAW, BULKLEY & CO., AGENTS

San Francisco, Cal.

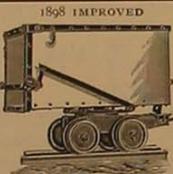
ORE CARS.

All miners who have used the Truax Automatic Ore Cars say they are the best in the market.

Over 3,000 In Use

MANUFACTURED IN

SAN FRANCISCO, CAL., by
The Truax Mfg. Co.,
114 First Street



PATENTED:
Jan. 8, 1892. Aug. 7, 1895.
July 19, 1898.
In Canada, June 21, 1898.

MANUFACTURED IN
DENVER, COLORADO, by
The Truax Mfg. Co.
1717-1719 Wazee St.

We make all kinds of cars, skips and charging cars for the Mine, Mill and Smelter. All miners should have our pamphlet of useful information.

Dealers wanted in Mining Sections to handle the TRUAZ ORE CARS.

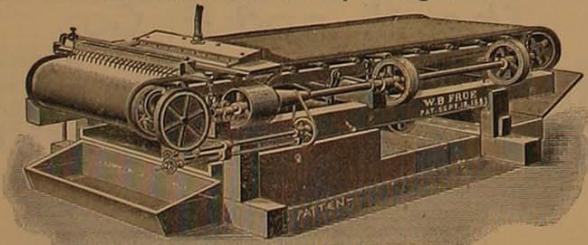
THOMAS PRICE & SON

Analytical Metallurgical and Physical Testing Laboratory

524 SACRAMENTO STREET, SAN FRANCISCO, CAL.

FOUR and SIX FOOT FRUE VANNERS

With Brownell "Patent Lip" Flange Belts



After a Concentrator like the Frue Vanner has been on the market nearly two decades, and the sales have constantly increased, it is safe to say it is the "Standard Machine of the world." More vanners have been sold during the last twelve months than for the same period at any time during the history of this machine. Practical mining men all parts of the world where mining is carried on will testify as to its merits. It is the "Standard" which all competitors are trying to imitate.

The results obtained by this machine are the "Acme" of concentration, and several cheap and untried machines that have lately come on the market compare by it, and the manufacturers will tell you that they are "just as good, and cheaper, etc." The facts are that no other concentrator made has an equal capacity, or will yield as clean a concentrate with as small loss in the tailings as the Frue Vanner. The amount saved from the lower first cost of an inferior machine counts little in the years results, when compared with the increased output from a Frue. This machine not only gives better results at both ends of the belt (i. e. Clean product and poor tailings), but is operated at less expense and requires less attention than any other machine on the market. At the Alaska Treadwell Mine where they have ordered over 350 Frue Vanners one man attends 48 machines for 12 hour shift.

FOR DESCRIPTIVE PAMPHLETS, ADDRESS

JAS. S. BROWNELL, Western Agent
132 Market Street,

FRUE VANNING MACHINE CO.
(Successor to Adams & Carter)
SAN FRANCISCO, CAL.

ESTABLISHED 1871

C. L. BERGER & SONS

Successors to

BUFF & BERGER

Mining and
Engineering Transits

With patent interchangeable
auxiliaries. Telescope for use on
top side vertical sight line.

Our friends are cautioned
against infringements foreign
or domestic as attempts have
been made of late to mislead
the public.

Send for Illustrated Catalogue and Manual

11 Province Court, - Boston, Mass.

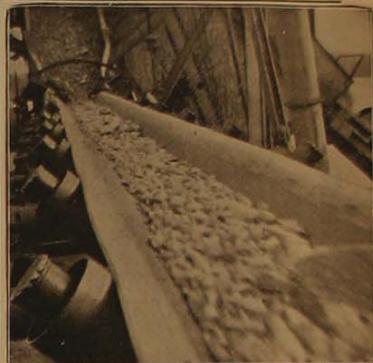
F. A. JONES, E. M.
MINING ENGINEER

Assays, Surveys, Reports, Plans, Etc., Chemist
State Geologic Survey.

OLIVER W. KRULL, Mining Engineer Asst.

OFFICE AND LABORATORY

14 W. Missouri Ave., Kansas City, Mo.



Cut Shows Robins Belt Conveyor
Handling 1100 tons per hour
of Rock and Gravel on

River Dredge

For 1899 catalogue description of system
Write to

Robins Conveying Belt Co.
147 Cedar Street, New York City

GOODSELL'S "98" PUMP PACKING



WAX END SEwed.

Patent Pending

No possibility of Splitting. All imperfect features of Duck packing overcome. Price 75¢ lb net.

Goodsell Packing Co.,

SOLE MAKERS
33 South Canal Street Chicago, Illinois

SWEEPINGS ★

Metallic Wastes, Dental Scraps,
Photographers' Wastes,
Jewelers' Sweeps, Mill Wastes,
Amalgamated Plates, Old Iron Retorts,
Old Quicksilver bought.

A. M. DONALDSON & CO.,
1661 Larimer St., Denver, Colorado

The Little Alaska Gold Washer

WEIGHT 7½ POUNDS

Positively Saves all the Gold

No Miners, Prospectors or Assayers outfit is complete without it. Requires no experience to work.

Handsome descriptive catalogue mailed free on application,

PRICE \$6.00

204 S. BROADWAY, LOS ANGELES, CAL.



Become a Member of the
SOUTHERN CALIFORNIA BRANCH —
California Miner's Association

To Protect, Develop, and Foster the Mining Industry of the State of California, in all its Branches
 Secretary's Office, 420 Stimson Block, Los Angeles, Calif.

THE NATIONAL IRON WORKS



Riveted Boilers, Tanks, and Sheet, Steel or Iron Work of every description.
 MANUFACTURER OF THE
 Repairing of All kinds Promptly Attended to.
 PORTLAND, OREGON

FULTON ENGINE WORKS
Mining, Milling & Smelting Machinery

Estimates Furnished on all Classes of Mining Work
 P. O. Box 296, STATION "C" LOS ANGELES, CALIFORNIA

Bullock's Diamond Prospecting Core Drills

These are the only Machines which will give absolutely accurate records of borings. Fifteen styles and sizes. Operated by hand, horse, steam, air or electricity.

Monarch Rock Drills

Any style of mounting. Simple, compact, economical. Operated by air or steam
Hoisting and Haulage Machinery to fill any requirements.

M. C. BULLOCK MFG. CO.,
 1169 West Lake Street, CHICAGO, ILLINOIS

Chas. P. Grimwood,
Mining Engineer and Metallurgist
 Laboratory, 214 Pine Street, SAN FRANCISCO, CAL.

CYANIDE POTASSIUM—99 per cent. pure, Beckton Brand.

CHLORIDE LIME—Best English in Casks and Drums.

ZINC DUST—Best Heavy Quality.

POTASH PERMANGANATE—Pure Quality.

SODA HYPOSULPHITE—Barrels and kegs.

AND ALL OTHER CHEMICALS

Please Apply to Schoelkopf, Hartford & Maclagan, Ltd.,
 100 William Street, New York

~ FOR SALE. ~

Four Fraser & Chalmers horizontal Boilers in batteries of two, can be seen set up
 Size of Boilers: 54"x16', 44 3½" flues, half arch front, include all fittings complete and in first class order; will sell 2 or 4. Price each, \$300.

One 300-H. P. Fraser & Chalmers Corless Engine Cylinder, 24x48", sectional fly wheel, 20"x37". Engine in fine condition. Price \$1,500.

Forty-stamp Mill, 850 lbs. rapid drop, together with timbers, bolts, rods, &c.; also building if wanted. Tuloc automatic ore feeders, screens, jigs (Heads), Frue Vanner tables, &c., fine condition and very cheap. Write or come and see us.

The S. S. Machinery Co., Denver, Colo.

Oilless Bearings



FOR

Rope Tramways, HOISTING Engines, Tackle Blocks, Cam Shafts in STAMP MILLS. A Practical BEARING that RUNS WITHOUT OIL
 The Graphite Lubricating Company
 BOUND BROOK, N. J.

MINING MACHINERY.

If you want mining machinery of the first class address the MINING AND METALLURGICAL JOURNAL, stating the purpose to which it is to be applied, and you will be placed in communication with the leading manufacturers of repute. All the latest catalogues of mining machinery are kept constantly on hand.

Stimson Block, Los Angeles, Cal.
 150 Nassau St., New York, N. Y.

Horace F. Brown, M. E.

Mechanical Roasting, Cooling and Conveying of Ores. Automatic milling plants adapted to standard processes.
 PRESENT ADDRESS, VICTOR, COLORADO

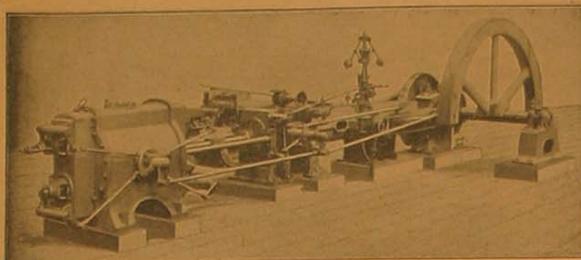
Established 1887
WADE & WADE ASSAYERS 

Chemical Analysis, Milling, Concentration and Cyanide Tests

Call and See our Stamp Mill and Frue Vanner 115½ N. MAIN ST., LOS ANGELES, CAL.

FRASER & CHALMERS

133 Fulton Street,
Chicago, Illinois, U. S. A.
43 Threadneedle Street,
E. C., London, England



STAMP MILLS
ROCK CRUSHERS
HUNTINGTON MILLS
SMELTING FURNACES
GRAY'S PATENT MINE CHAIRS
CONCENTRATORS
HOISTING ENGINES
ROASTING FURNACES
BALL PULVERIZERS

Exclusive Manufacturers of
RIEDER PUMPS and
AIR COMPRESSORS

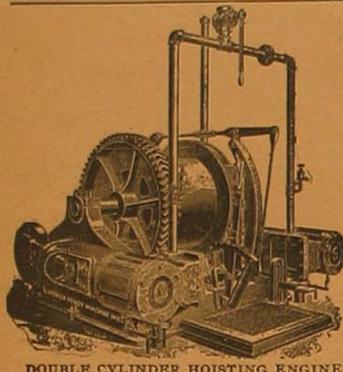
For

UNITED STATES, CANADA,
MEXICO, SOUTH AMERICA,
ENGLAND, SOUTH AFRICA
AND AUSTRALIA.

The accompanying picture shows the Air Compressor we make

Fraser & Chalmers, GENERAL AGENTS FOR GREEN BLOWERS

JOSHUA HENDY MACHINE WORKS, Nos. 38 to 44 Fremont St.
SAN FRANCISCO, CAL.



Manufacturers of and Dealers in
The Latest Improved

Quartz Milling, Pumping, Hoisting and Smelting
Plants, Air Compressors and Rock Drills.

"HENDY" IMPROVED "TRIPLE-DISCHARGE" TWO-STAMP QUARTZ MILLS
Boilers, Engines & Pumps of all capacities

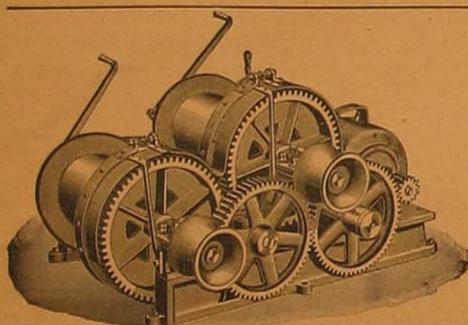
PLANS, SPECIFICATIONS and ESTIMATES OF COST SUBMITTED and CONTRACTS ENTERED INTO
FOR FURNISHING and ERECTING MINING and MILLING PLANTS for all conditions of Use.

BAKER IRON WORKS

LOS ANGELES, CALIFORNIA

Mining and Milling Machinery, Atlas Engines and Boilers, Worthington Steam Pumps ▷

Water Works Machinery
A SPECIALTY



LAMBERT HOISTING ENGINES

ELECTRIC HOISTS

BUILT TO GAUCES AND TEMPLATES
500 STYLES AND SIZES

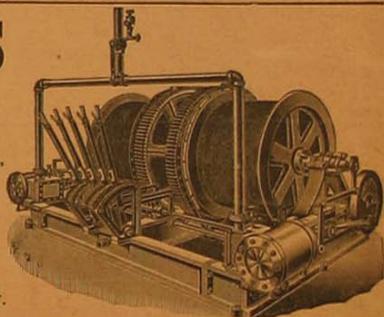
Prospectors and Contractors Engines || Mining Engines and Electric Hoists,
Single and double drums with || with single, double or triple drums.
and without boilers. || Friction or reversible.

SEND FOR NEW CATALOGUE R, 140 PAGES.

LAMBERT HOISTING ENGINE CO.

MAIN OFFICE AND WORKS:

117 POINIER ST., NEWARK, N. J.
17 Main St., CAMBRIDGEPORT, MASS. 143 Liberty St., N. Y.



Mining Timbers and Construction Lumber

(Caleasieu Long Leaf Yellow Pine Lumber)

Prices given for delivery to any point in Mexico by Rail through Porfirio Diaz, Nuevo Laredo or Paso del Norte, and by Vessel through Gulf Ports of Tampico and Vera Cruz.

Bradley-Ramsay Lumber Co.

LOUISIANA, U. S. A.

ADDRESS INQUIRIES FOR PRICES TO

R. N. WATSON, AGENT.

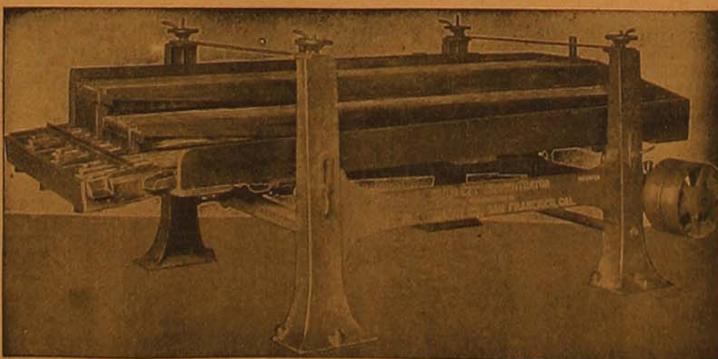
APARTADO NO. 118 MONTERREY, N. L. MEXICO

The Bartlett Concentrating Table

One of these Machines will take the place of TWO or THREE Belt Concentrators of any make and do as good work. Separates ALL the minerals from each other at one operation. GIVES THREE CONCENTRATES on the one Machine at the same operation. The Machine is especially adapted to the separation of Zinc and Lead. Size of machine 4 ft. by 8 ft., Weight 1000 lbs., Capacity 10 to 30 tons per 24 hours.

Can be set up anywhere.
Requires no Special Foundation.

Licensee for the
Manufacture and Sale



Three Classes of Machines are made

Table A is adapted to concentration from 2 into 1 to 3 into 1. Table B, 6 into 1 to 16 into 1. Table C, 12 into 1 to 32 into 1. N. S. E.

Parties desiring tests made can send 50 lbs. or more, charges prepaid, and a run will be made and reports forwarded of the results, free of all charges, except for the assays, which will not exceed \$10.00.

Price of 9½ ft. Table \$300 Complete,
12-foot Table \$350,
f. o. b. Cars, San Francisco, Cal.

Los Angeles, Cal. Office,

306 Byrne Bldg. F.M.P.
W.H. Miller, Representative

21 and 23 Fremont Street
SAN FRANCISCO, CAL.

PARKE & LACY COMPANY,